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ARCHITECTURAL RECORD

House at Williamstown, Massachusetts • Marcel Breuer, Architect

Damora photograph

APARTMENTS

FEBRUARY 1949

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ARCHITECTURAL

RECORD

CODES, COSTS AND STANDARDS

WHILE architects, engineers, builders, manufacturers and building officials have long been aware of the burden of the obsolete, inflexible, specification-type building codes, it is only recently that the public has become aware of the necessity for radical change and politicians have taken up the cry. Newspapers in the past few months have headlined at least one governor's demands for a new code to reduce costs, especially in view of expanding public housing and school building programs. An era of new freedom for the development of more efficient, economical building materials, techniques and administration is about to be ushered in.

A universal performance code will mean a new freedom for manufacturers to develop materials, have them tested once and then approval given for use on a national instead of a local basis: a new freedom for architects, engineers and builders to devise new ways to design assemblies of materials rationally, economically and imaginatively. The "performance" type code will perform still better its prime function of safeguarding the public from the structural, mechanical, fire, sanitation and use hazards of buildings.

Three things are necessary if the universal, uniform building code is to be adopted and effective — (1) The code must be of the performance type, setting standards "to meet the functional requirements of structures in terms of their intended use"; (2) the code must set standards for tests of material, equipment and their assemblies; (3) the code must set standards for administrative procedures. (ARCHITECTURAL RECORD, March 1946.)

One such code is becoming a reality under the auspices of the Building Officials Conference of America, Inc., which has now released its abridged code for use by smaller communities. Their master code is scheduled to appear this year. The National Board of Fire Underwriters, which has published suggested codes since 1905, has just issued its 1949 edition, based on performance requirements.

A performance code demands a most important next step, for it creates the need for an organization which will function in the testing and approval of materials and assemblies. The duties of the organization would range from the setting up of testing standards, methods, and procedure, to evaluating test results and determining performance ratings, and finally to disseminating such information and interpreting it. Present organizations and facilities within the industry should be coordinated for these purposes rather than attempting to create and impose a new governmental agency to carry out these functions. Pending legislation on housing (which will probably involve far-reaching sections relating to standards and research) should be examined to see that it augments rather than contravenes ths work already accomplished toward a uniform performance code. The time is ripe for the adoption of such a code throughout the country, and the building industry's own facilities and know-how should be employed to the full in setting the standards, in testing and in interpreting.

Kenneth K. Stowell

EDITOR

Damora

A HOUSE FITTED TO THE BERKSHIRE HILLS

Marcel Breuer

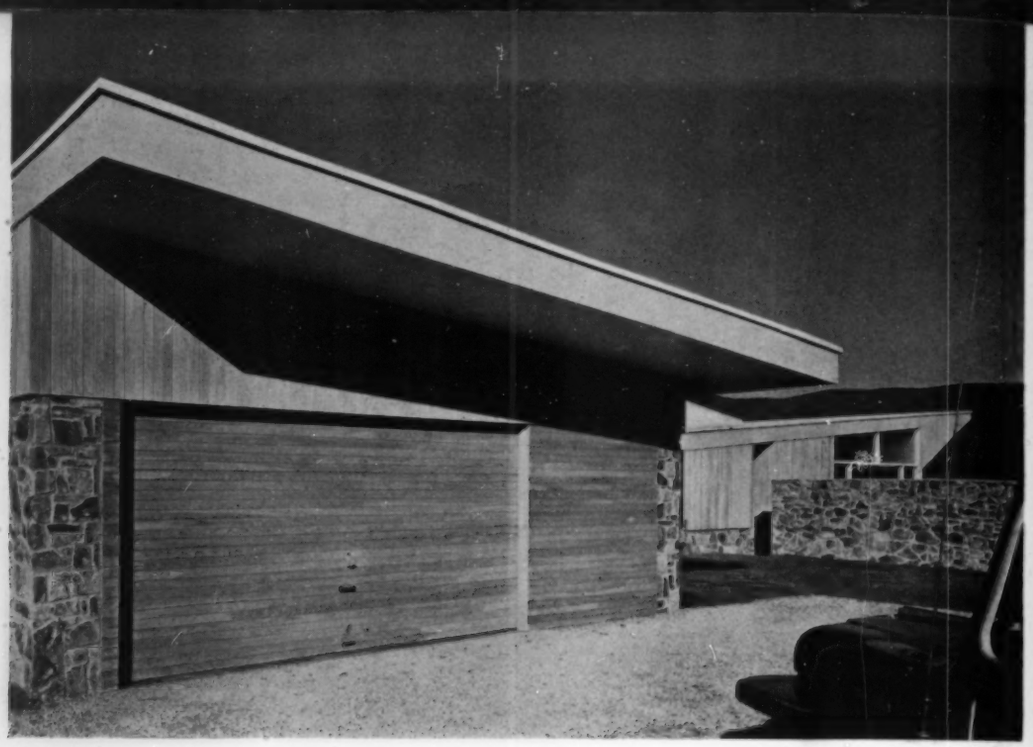
ARCHITECT

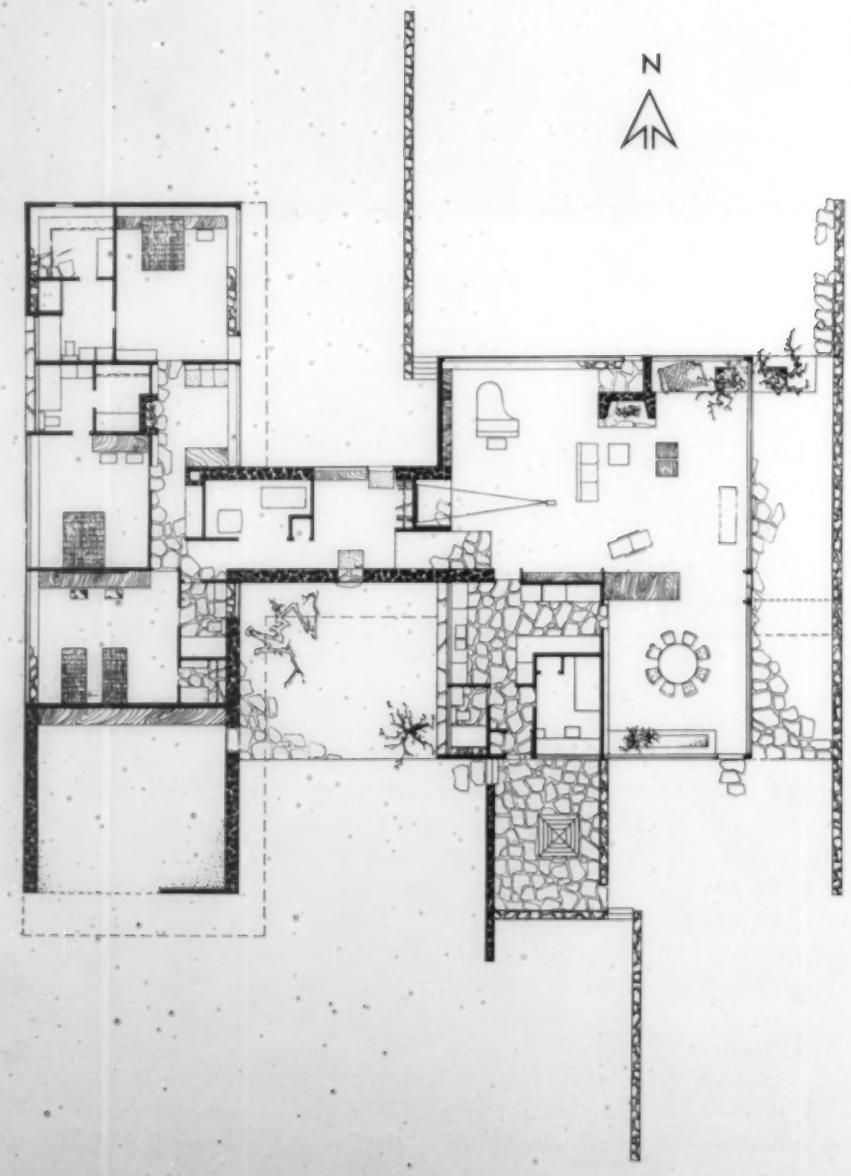
IT IS by the resolution of strong opposites that this house gains its character. Breuer as architect avoids easy rustic "blending"; on a magnificent site outside Williamstown, Mass., he has pitted strong geometry against the big Berkshire hills. Yet the butterfly roof-lines echo the hills; and by means of long stone fences or parapets the architect has "run the building out" and tied it in with the ground.

A sports-loving, skiing family asked to have virtually no barriers between itself and the great out-of-doors. Quartz-stone parapets are intended to act as psychological retainers *outside* the big glass walls, and keep the space from "floating away." Despite the simplicity of the large house forms, and the unity of the work, the space cadences are highly multiplex.

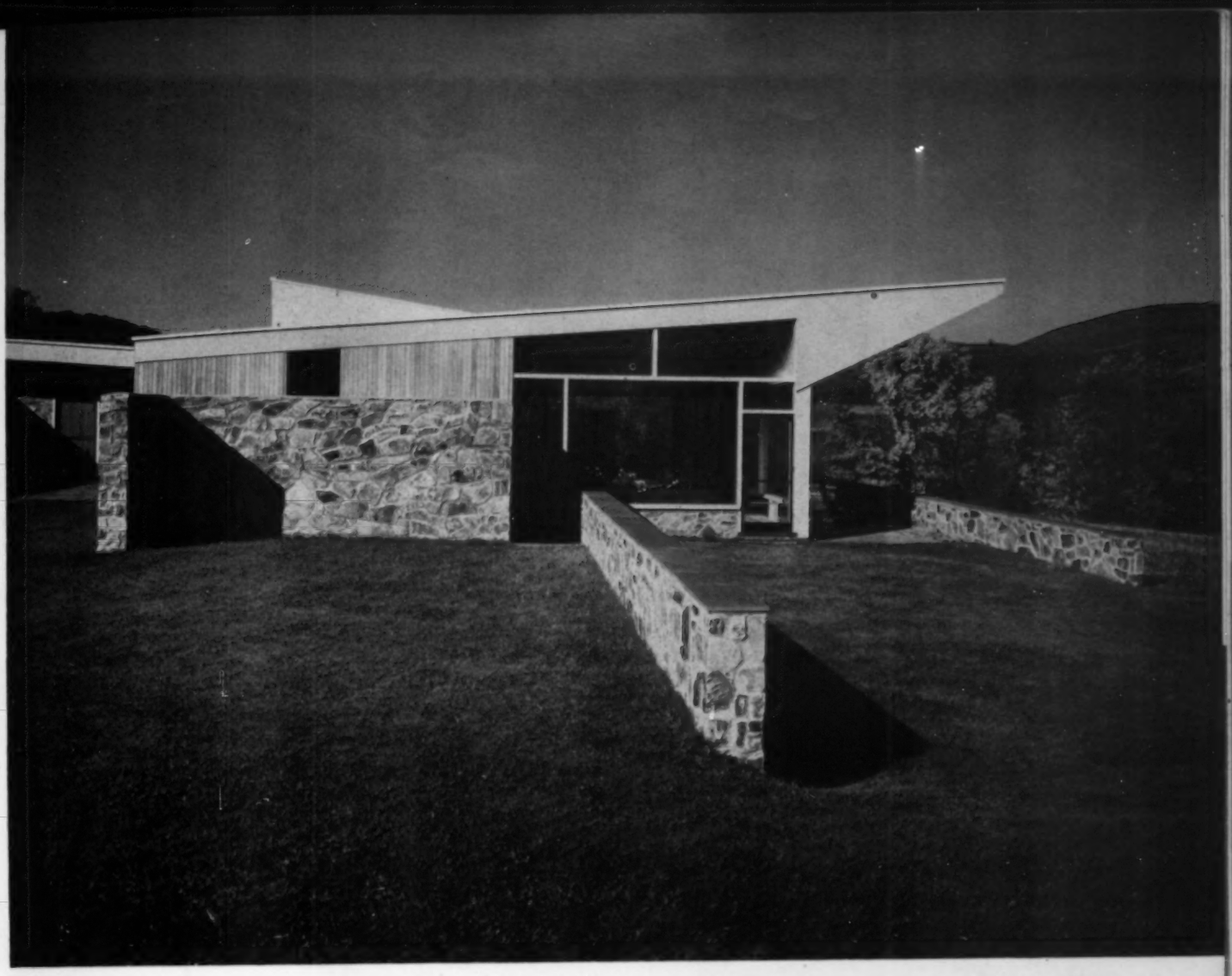
The plan is an H-shaped, or "bi-nuclear" one, with the living room to the north and east (for view) instead of south (for sun); but the dining room is virtually a southern extension.

Materials are boldly contrasted: multi-hued tapestries of rusty-toned field stone against smooth, natural golden cypress, against subtly painted sheets and lines of trim, in light grays, blues, greens, yellows — and even an off-white pink — playing with the polished glass.



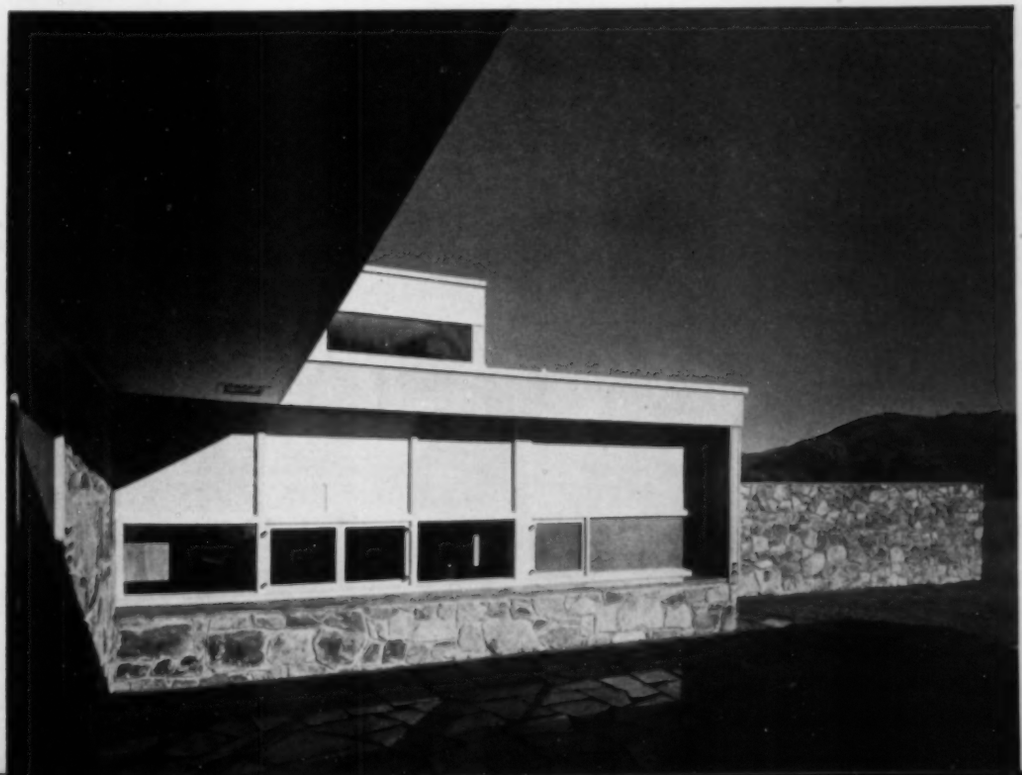


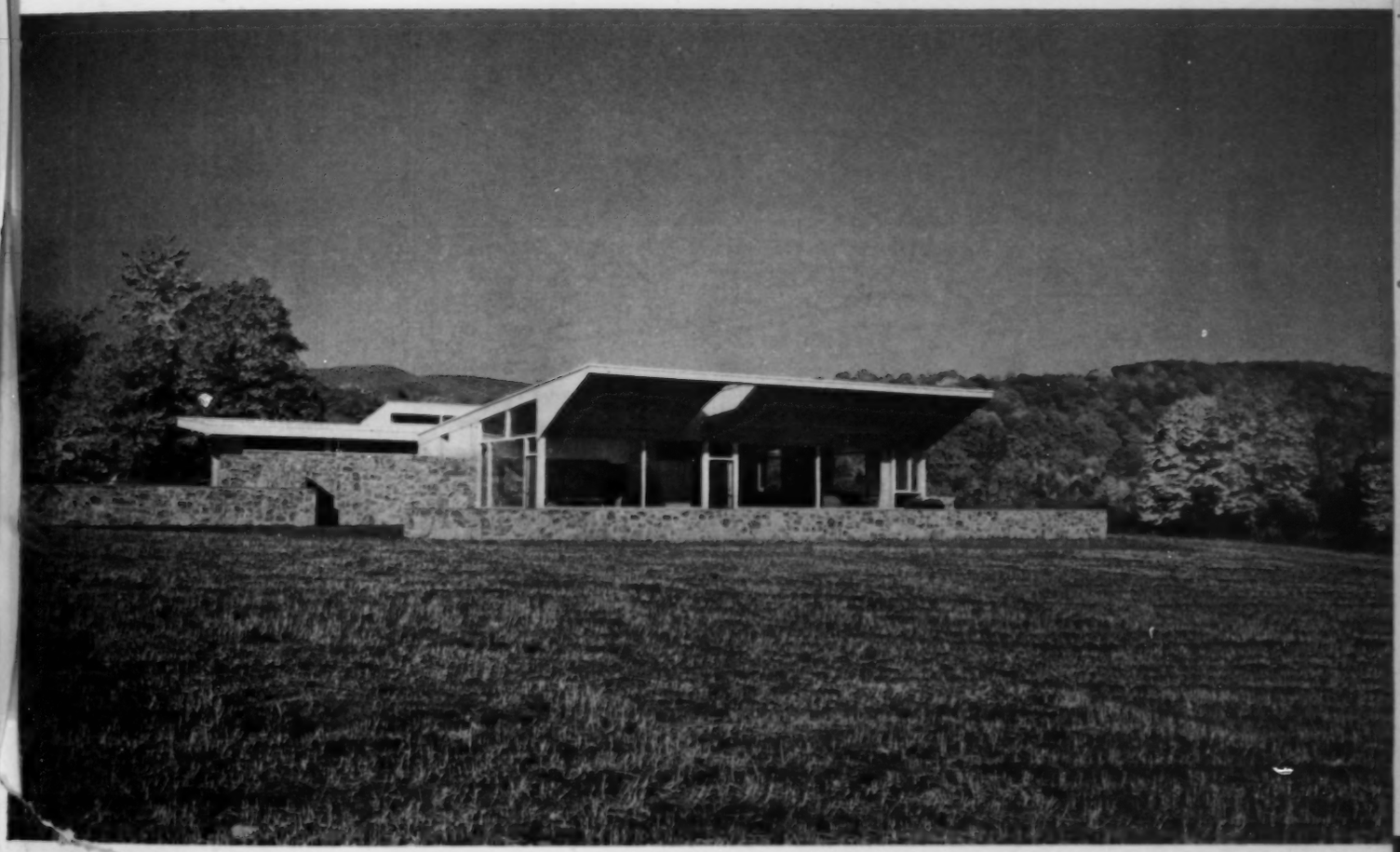
Here's a "bi-nuclear" H-plan turned ninety degrees for views north, east, west. The patio entrance arrangement, to the south, is worth special study. Garage, main entrance, kitchen entrance are closely grouped but service areas segregated nonetheless. The living room, to the right of the entrance, turns a corner around a head-high bar and china closet, to become the dining room. "Pass-through" arrangements between dining space and kitchen have been strictly avoided. The north suite of the bedroom wing, to the left in the plan, is the master bedroom, with dressing room and bath to the west, and to the south a miniature sitting room and study with fireplace. The next suite is the daughter's and the bottom suite the guest's. From the entrance court to the garden court there is a glimpse right through the connecting corridor into the garden court off the master bedroom



Damora

Visitors have found the entrance patio one of the most successful features of the house. From the garage (seen across-page) the way leads through a blue-stoned paved court (glimpsed at the left in the view above) to the entrance door (again at the left, in the view below). To the west the court is firmly defined and held by the garage stone wall and roof overhang; to the east it drops gradually away past the glazed kitchen wall (below) and successive stone walls, ever widening the area. As the entrance door is opened, there is suddenly another big vista, across the corridor and through the garden court to the north





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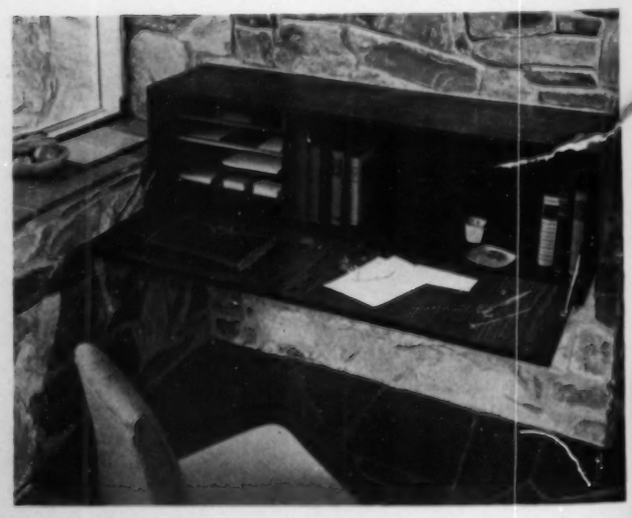
The big visor facing the east originated in the owners' desire for a generous "unscreened porch." It admits cheerful sun, mornings; shades the terrace, afternoons. Breuer explains the sharp cleft, or well, near the middle of the overhang, as a device of multiple service: it carries a sense of the sky into the room; it encourages convection currents on still days, and funnels out storm winds which might otherwise threaten both the roof and the glass. In the larger horizontal view above may be glimpsed one of the clerestories (one for each wing) which admit more sky and light, and add another dimension of freedom in space

The little postage stamp view (left) repeats the color illustration on the Record *cover, showing the north end of the living room. (At the extreme left on this cover picture is the piano.) The fireplace capitalizes the rusty local quartz. Ceiling is polished birch plywood. Floor is carpeted with Haitian rush matting. Glass wall is full curtained with fiberglas fabric, and cove light (detailed overleaf) is reflected from plywood covering the truss. Desk is situated in the sitting-room study off the master bedroom*



An official answer comes from Mayor William O'Dwyer of New York City. Commenting on a joint progress report on the wage stabilization agreement, submitted to the Mayor recently by officials of the B.T.E.A. and the Building Trades Council, Mr. O'Dwyer said:

"Both employees and contractors have had difficult and serious problems to overcome . . . (but) stabilization of wages and the leveling off on material prices now make possible firm bids that do away with possible rises that adversely affect contracts . . . It is important to note that these gentlemen, under trying circumstances brought about chiefly by rising costs, have done a remarkably fine job.

"This stabilization applies only in New York City and no place else in the nation. The City is grateful to them for their help in making it possible for the City to plan its future building program."

The progress report was submitted to Mayor O'Dwyer by Peter W. Eller, chairman of the board of governors of the B.T.E.A., and Howard McSpedon, president of the Building Trades Council. Emphasizing that without stabilization, responsible contractors could not risk bids on work which of necessity involved long time planning and a long time for building, the report said:

"After many months of hard negotiation the Building Trades Employers' Association and its constituent trade associations and thirty-odd trades of the Building and Construction Trades Council signed an agreement called, and truly, a stabilization agreement, which fixed wages for two and one-half years from January 1, 1948 to June 30, 1950. This represented something new in collective bargaining.

"With or since such agreement there have been parallel agreements with several trades who could not or would not become signators to the stabilization agreement. Only two trades have not yet fixed their wages on the agreed formula to June 30, 1950. This agreement fixes wages not only for the 1000 members of the B.T.E.A., but for all who contract for building construction in this area. There is, therefore, stabilization of wages until June 30, 1950, or foreseeable wage differences for all who build . . .

"It was not easy for the employers in the face of existing contracts, outstanding bids, obligations to their customers and other conditions, to agree to immediate wage increases as part of the stabilization agreement. It was not easy for leaders of the labor unions with whom there has been collective bargaining for more than fifty years to accept a long term agreement in the face of rising living costs. We are confident that our labor leaders and their unions will hold the line and we are hopeful that the stabilization agreement or its formula will cover the few trades not yet in agreement . . .

"Informed opinion in the industry holds that there is no reasonable expectancy that costs will decline in the year or more ahead. We believe that the report should inspire confidence in our contractors and their labor forces and should encourage construction now."

All segments of the industry — architects, engineers, builders, labor and material suppliers — have been much subjected to severe criticism since the end of the war, much of the criticism unfair and stemming from a misguided public which has not been fully informed on the problems and achievements of the complex building industry. Now, there is talk of a fourth round of wages increase in manufacturing and industrial plants. If permitted, the costs of building materials and equipment are likely to increase.

However, New York City finds itself in an enviable position in regard to building labor in the field. With wages frozen until June 30, 1950 and all indications that the union leaders will hold the line, there is little likelihood that the wage pattern will be upset. This factor alone underscores the advantages of effective collective bargaining between enlightened management and labor in the public interest.

A stabilized wage scale is a major contribution toward a stabilized industry. Both labor and management have a big stake in such stability, and with building costs reaching a postwar plateau, an increase in building means more jobs and a stronger, more efficient industry.

After the long months of bargaining which gave birth to the agreement, comments of the two co-chairmen of the negotiating committees express the enlightened attitude of labor and management.

Howard McSpedon, president of the Building Trades Council: "The agreement is unprecedented in many respects and there are many benefits to the industry, labor, and the public generally. The building mechanics are proud of their part in bringing about the accord."

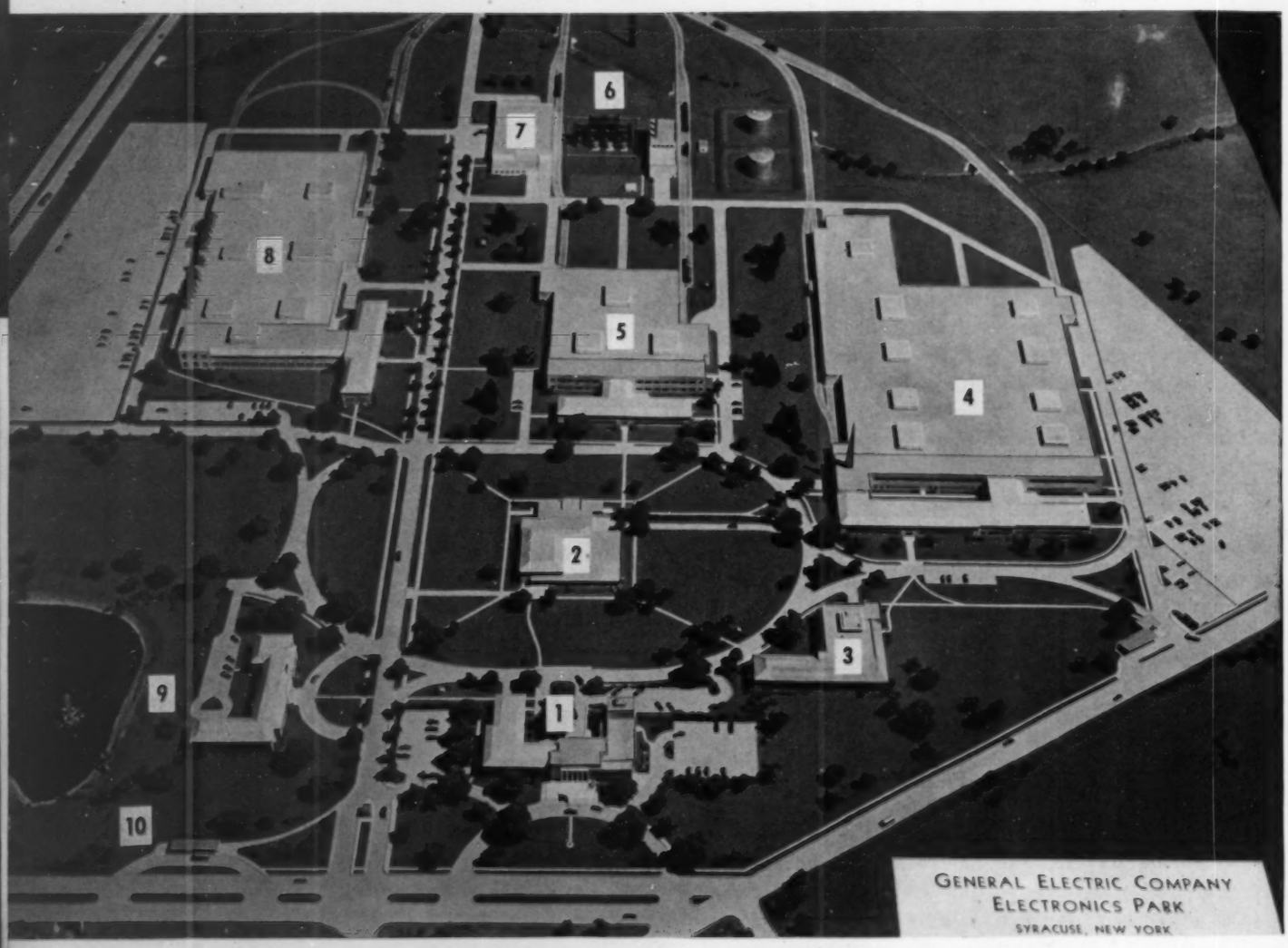
Fred J. Driscoll, chairman of the B.T.E.A. committee: "The agreement is a major step toward stabilizing over-all building costs in Metropolitan New York and should help stimulate a higher level of housing and commercial construction."

BTEA Committee which negotiated the wage stabilization agreement after seven months of collective bargaining with union officials representing the 200,000 building craftsmen in the Building and Construction Trades Council of Greater New York and Long Island. From the left: William G. Wheeler, secretary of the B.T.E.A.; August P. Petrillo; Fred J. Driscoll, chairman; Robert B. Miller, and Roger H. Corbetta

Electronics Headquarters Group for General Electric Company

Giffels & Vallet, Inc., L. Rossetti, Engineers and Architects

ELECTRONICS PARK, SYRACUSE, NEW YORK



LEGEND

1. Reception
2. Cafeteria
3. Laboratory
4. Receiver
5. Specialties
6. Boiler House
7. Service
8. Transmitter
9. Administration
10. Bus Station

REVERSING many of the familiar concepts of industrial developments, the electronics headquarters of the General Electric Company has combined electronics research and manufacturing in a campus scheme in a parklike setting, such as it has long had at Nela Park for lighting.

Instead of the usual huge manufacturing building, designed for concentration of processes and anticipating considerable expansion, Electronics Park divides its manufacturing activities in separate buildings for three distinct divisions, in none of which is expansion contemplated. While there is one general office building, each of the manufacturing divisions also has a separate office building. Research is concentrated in the Laboratory Building; and two other buildings — Reception and Cafeteria — group together various employee facilities.

This general *parti* is explained by the fact that Electronics Park is a nerve center for electronics; there are more than a score of manufacturing plants for electronic equipment scattered over the country. Such scattering grew out of wartime expansion, but it also follows a GE policy of dispersion of facilities. The Park, then, is

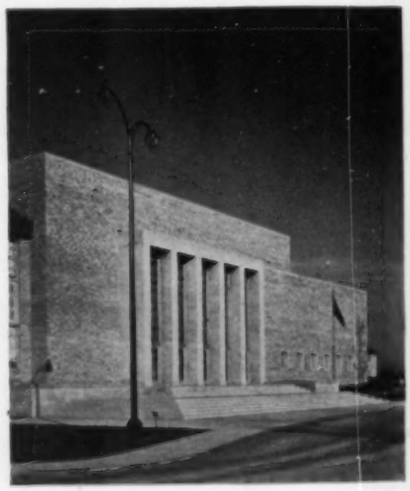
Gottscho-Schleisner photos

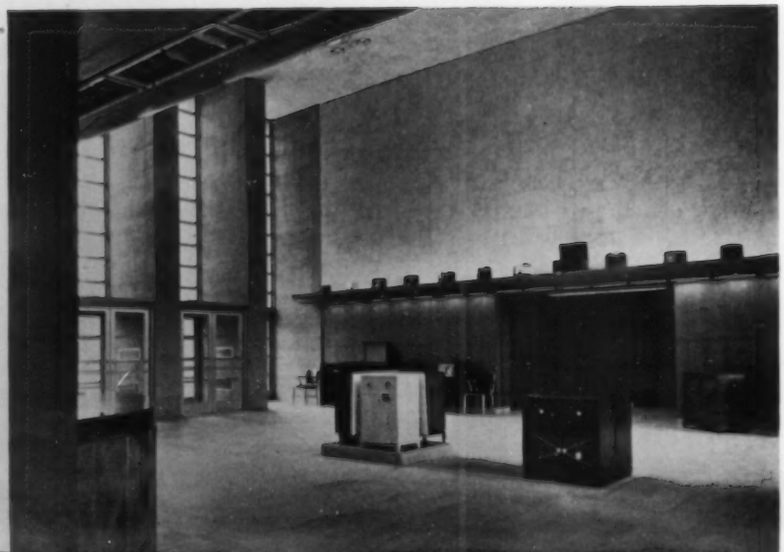
RECEPTION BUILDING

CAFETERIA BUILDING

BOILER HOUSE

Gottscho-Schleisner Photos



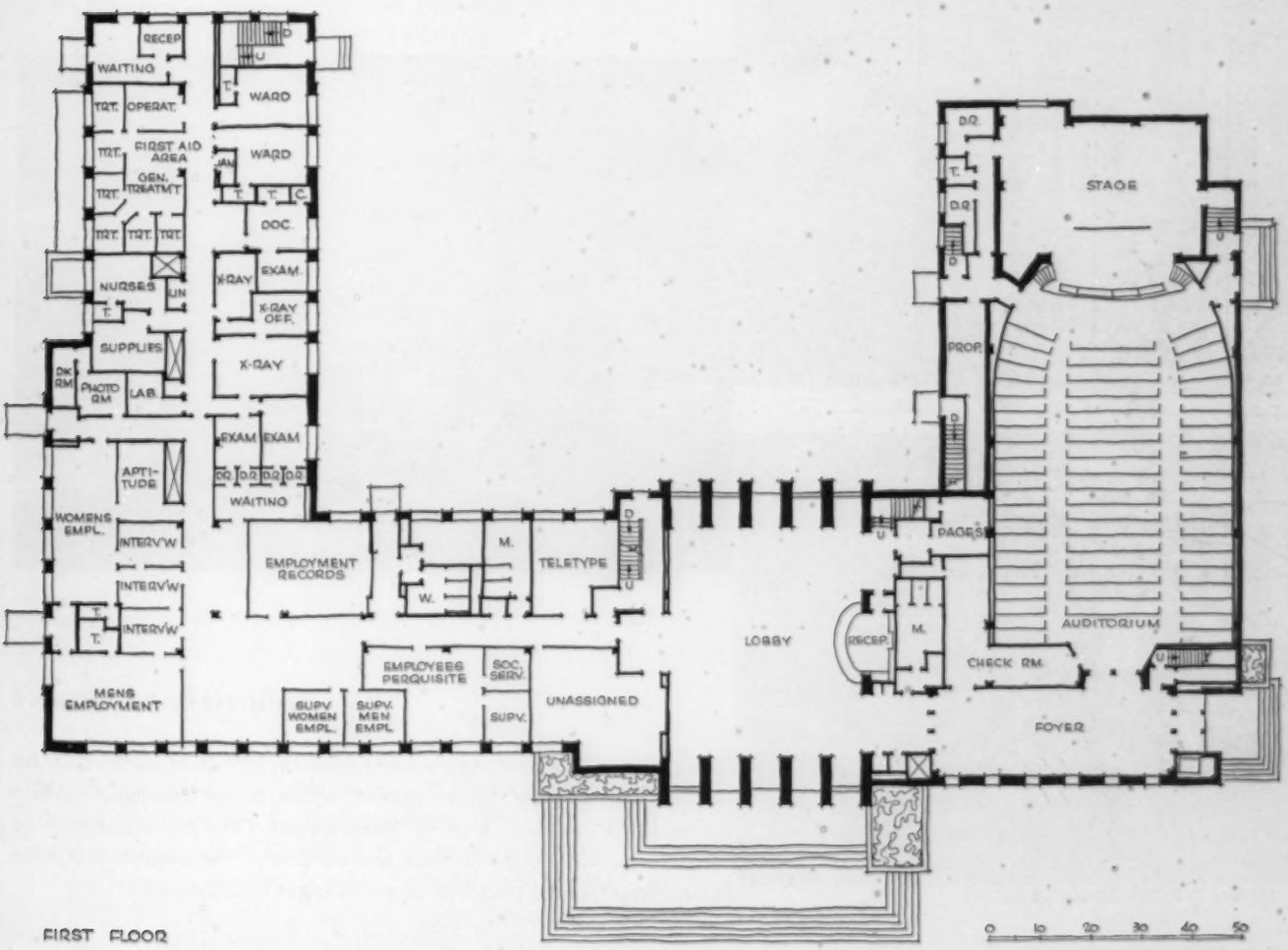


designed for 6,000 employees — this figure came from a study of available labor — and when manufacturing activities outgrow their portion of the Park they will be expanded with new plants elsewhere, or moved bodily. In general manufacturing activities at this headquarters will be those which need the most laboratory research (television for a current example). Transmitters and Specialties are the other manufacturing divisions now here, and these are likely to remain close to the research engineers.

Within the dictates of the campus concept the designers worked to achieve efficiency and flexibility in the individual buildings. The original design for the entire project was developed in a modular system of brick and masonry, but at that time brick and other manufacturers were not ready for full-scale production of modular materials. It was necessary to change all details and dimensions to conform to old standards. It was still possible, however, to standardize on two-foot piers and six-foot windows in all laboratory and office sections.

These units permitted a basic space module of four ft., with offices or laboratories 8, 12, 16 ft., and so on.

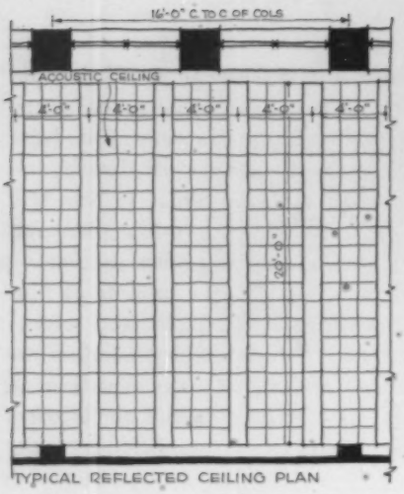
Flexibility in space use is maintained by standardization on metal partitions and metal pan acoustic ceilings, with lighting on four-foot centers and air diffusers and sprinkler heads at eight ft. Air conditioning units



FIRST FLOOR

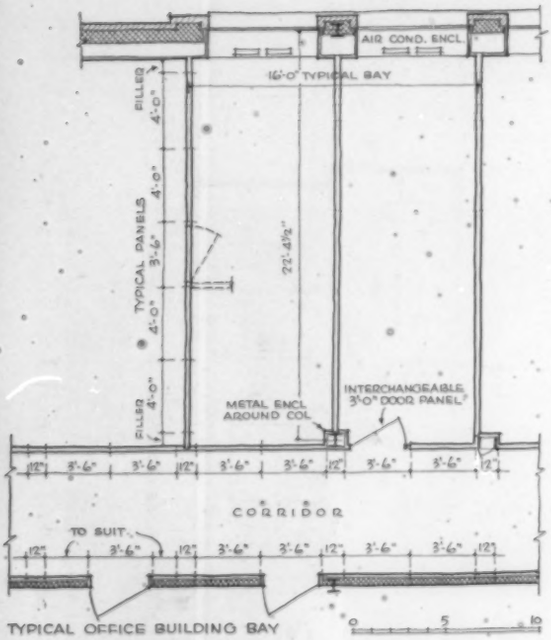
RECEPTION BUILDING

Reception Building is a multi-purpose building for visitors and employees. Here are show spaces for the products of the division, health and recreation facilities for workers, and a large auditorium useful for everything from theory lectures in radio engineering or demonstrations to visiting sales organizations to employee gatherings. The "camp" chairs shown make it easy to clear the floor



TYPICAL REFLECTED CEILING PLAN

Gottscho-Schleisner Photos



TYPICAL OFFICE BUILDING BAY

The typical office bay (above) measures 16′ by 22′–4½″ (column centers), has movable steel partitions and steel panel walls, metal pan acoustic ceiling and recessed fluorescent lighting. Virtually everything is movable and salvageable; permanent fixtures are on 4- or 8-ft. centers to match the space module.

ADMINISTRATION BUILDING

While each of the three manufacturing units has its own office building, the Administration Building houses general offices of the Electronics Division (office of vice-president W. R. G. Baker below). Other office sections have the same module, the same finish and equipment; the Laboratory Building follows these general standards except in layout and equipment.

under windows have removable metal panel fronts, so that interior wall and ceiling coverings are virtually 100 per cent interchangeable and salvageable. The steel cellular floor system provides full flexibility for wiring and other services.

Exterior walls are of iron spot, buff brick, with cinder block back-up, and Mankato stone trim, sills, copings and entrances. All sash are aluminum, and, since all buildings are completely air conditioned, all sash are fixed, without ventilators. All pitched roofs are of copper, on 1½-in. insulation board and precast concrete roof tile.

All manufacturing buildings were originally intended to have solid brick walls, but a shortage of brick masons drove the designers to something else. The wall used is of metal sheet in mansard type, with 1½ in. of insulation, painted to match the brick work (detail on p. 102).

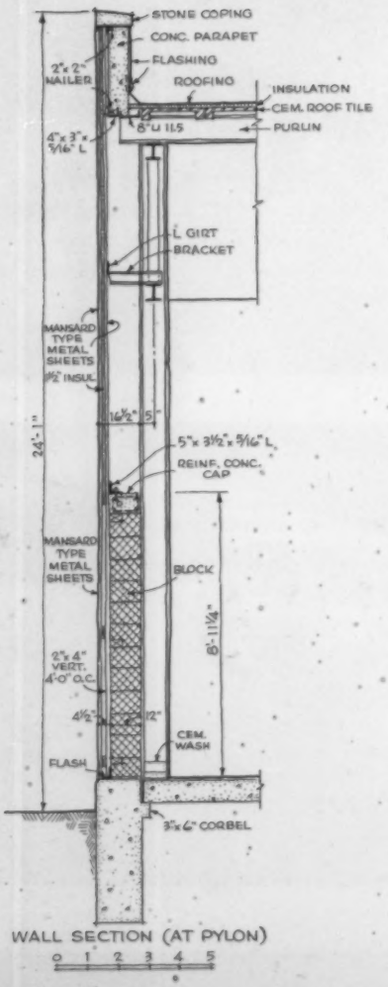
Flexibility was of especial importance in the manufacturing buildings, because it is virtually certain that operations will see many changes. In both the transmitter and specialty plants, present processes and foreseeable future ones appeared to be best suited to 50-ft. bays across the building and 40-ft. bays the other way. In the receiver building (television) the layout pointed to 45-ft. spans across and 50 ft. lengthwise. Trusses

CAFETERIA BUILDING

The cafeteria building, located roughly in the center of the "campus," has cafeteria for plant employees, dining room for engineers (who comprise 10 per cent of all employees) and executives. There are also private rooms for visitors and meetings

TRANSMITTER BUILDING

Due to a shortage of brick layers, manufacturing buildings depart from the standard brick finish with a more modern type of wall (section below). Wall is a mansard type sheet metal, with 1½ in. of insulation with some brick panels for relief



WALL SECTION (AT PYLON)

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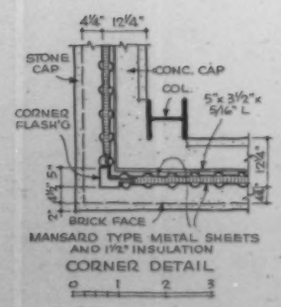


CORNER DETAIL

0 1 2 3

Above, one of the small laboratories. Below, the testing of the welded trusses before they were incorporated in the building. Note the hydraulic jacks between the pairs of trusses to produce the test loading to determine deformation (upper truss inverted to apply loading at same points as on lower truss)

RECEIVER BUILDING

Like other manufacturing buildings, the receiver section has inside railroad and truck docks. The 135 acres of the park require 3½ miles of track and 5½ miles of paved road so that trains and trucks may reach incoming and outgoing docks

Gottscho-Schleisner Photos

of the Warren type were designed originally for riveting, but it was later decided to use welding for all, and the connections were redesigned. Since the designs and connections began to get somewhat complicated, the engineers insisted on testing some of the trusses under load, to be sure that the intricate welded connections performed as anticipated. Three pairs of trusses were tested, the two in each pair opposing each other, with the load applied by hydraulic jacks between the two (photograph on p. 102). When everybody was satisfied, the designs were approved; the test trusses came through without any impairment and were used in the actual construction.

All of the buildings in the group are completely air conditioned. For the office building a unique design was developed to utilize GE window air conditioning units in conjunction with a conventional central fan system. Air is distributed, through wall grilles and ceiling diffusers from a central fan station, at a constant adjustable temperature normally set near the desired room temperature. Additional air called "primary air" is supplied to the window units, also from the central station. All air is returned through corridors to the central unit, where it is exhausted and replaced with 100 per cent outside air.

The bulk of the building's heat gain or loss is covered by the window units, circulating hot or chilled air as required, the wall and ceiling outlets handling mainly ventilation. Principal controls are arranged in a zone system for each building, but there are modifying controls on each window unit.

In the manufacturing areas the system is more conventional, with conditioned air supplied from central units at various points on the roofs. Air is discharged downward from ducts in the truss space. Small unit heaters around outside walls boost heating in severe weather.

The Receiver Building is the only one housing a real assembly line. The one below is one of three now rushing assembly of television receivers. A girl at each station takes less than a minute to add her little contribution of parts

David Fried, Architect

CAPE COD COTTAGE STYLED FOR SUMMER

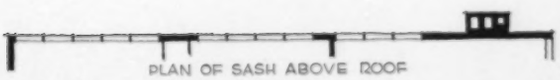
Cottage for Mrs. Ruth Boardman, "Saltboxes," South Yarmouth, Massachusetts

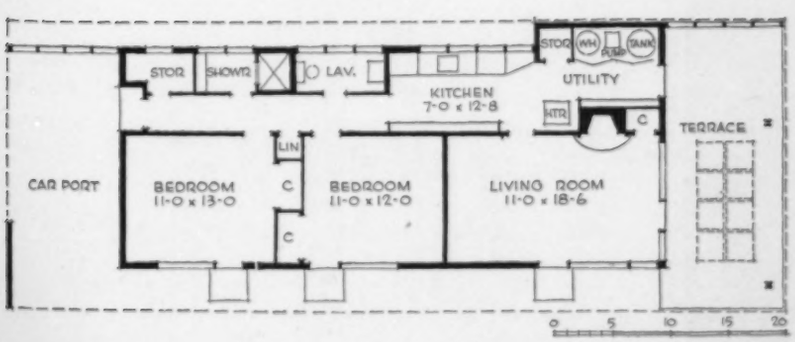
CAPE Cod in summer is as mild and delightful as it is blustery and cold in winter. So a house designed primarily for a sunny summer vacation can and should be quite different from the traditional snug, tight and tidy cottage. This house therefore makes the most of sun, breeze and view, opening the main rooms to the south, the services to the north. The clerestory invites a pine-scented air flow through the rooms, as well as added light. The kitchen, or galley, is small and doubles as a passage for economy's sake — not an objectionable feature where informal living is the rule. A forced warm air heating system is provided for, with a duct along the ceiling of the corridor serving all rooms.

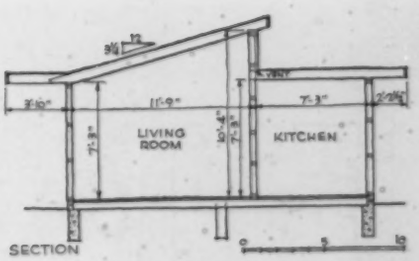
Haskell Photos

The east terrace-porch is frequently used for dining, served through the utility room. Below, a broad roof overhang on the south side shields the living and bed rooms from too much sun or rain and the pines provide shade for outdoor living. Exterior, vertical T & G local pine, painted white

The plan is simple and direct, permitting easy, economical construction and straight-line mechanical equipment. Storage is both ample and strategically placed, even "functionally segregated." The living room day-beds can serve overnight guests, but if an additional room is ever needed the carport could be converted. The separate shower room and lavatory are convenient and desirable







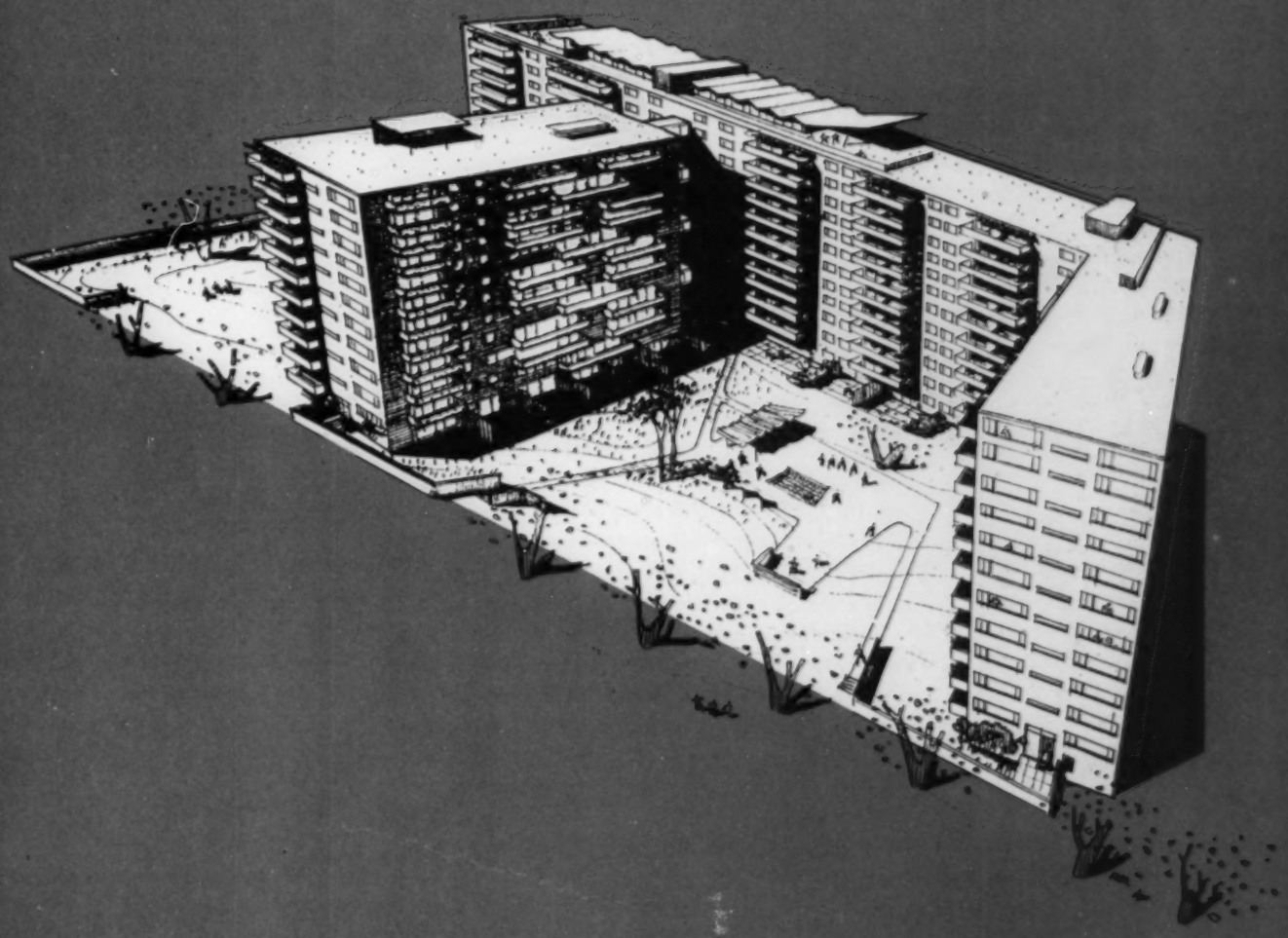
Haskell Photo

Natural-finish local pine boards form attractive living room walls. The ceiling is painted a soft yellow-green and the upholstery is sienna, chartreuse and brick red. Window drapery has a yellow and tan leaf pattern on a gray-green background. The plaid wallpaper of the bedroom is a Dorothy Liebes design in sand and green, bedspread a deep green, rug sand-color, and drapery off-white. The yacht-chair adds a note of coral

The kitchen ceiling and one wall are of sheetrock painted a persimmon color which is found also in the plaid of the white and yellow curtains. Other walls are finished in natural pine. Lilian E. Kenrick was the interior decorator

APARTMENTS

ARCHITECTURAL RECORD'S BUILDING TYPES STUDY NUMBER 146



EASTGATE APARTMENTS—*as a new plan type*

SKIP-FLOOR CORRIDOR PLANS—*a promising trend*—*by Julian Whittlesey*

BIBLIOGRAPHY ON SKIP-FLOOR APARTMENTS

KILLIAN

SMITH

BROWN

DE MARS

WILLAUER

KENNEDY

RAPSON

DAVIES

KOCH

Shortly before Thanksgiving, 1948, two venerated New England institutions announced the joint construction of "the most unusual apartment building in America." (Record, Jan., 1949, p. 88)

With this "Eastgate" scheme, the Massachusetts Institute of Technology and the New England Mutual Life Insurance Company had broken a log jam. Actual construction was begun on a plan type only striven for in the U. S., though found occasionally in Europe.

In effect, it stacks a series of long three-story row houses, or "flats," on top of one another in a "strip" plan, a highly intriguing architectural idea.

Elevator banks are widely separated. By a "skip-floor" scheme elevators open at every third floor to long access corridors, which run either through the center of the building, or along one side, past every apartment door. Other floors are reached from the corridor floor by auxiliary stairs.

Occupants derive from this scheme certain strong advantages hitherto peculiar to non-elevator row houses. *Every apartment* has one exposure to the most favored orientation. *Non-corridor apartments,* situated on two floors out of three, have two opposite exposures, one at each face of the narrow, slab-like building. They therefore also enjoy full through ventilation.

Site planners gain the chance to use buildings shaped as long thin vertical slabs, indefinitely extendable, as a welcome relief from our ubiquitous cross shapes.

Being designed for actual execution, Eastgate has a case history almost ideal for a Building Type Study; and the wonderful cooperation of the two institutions and the architects has made available full material.

As stimulus to further development, Julian Whittlesey, architect of many advanced apartments in New York, analyzes the history of the plan type, suggests code revisions needed in some cities to clear the way.

ARCHITECTS-ENGINEERS FOR EASTGATE

ARCHITECTS

William Hoskins Brown (liaison) — *Carl Koch* — *Robert Woods Kennedy*

Vernon DeMars — *Ralph Rapson* — *Dan Kiley* (landscaping)

ENGINEERS

Thomas Worcester, Inc., Architects & Engineers

Thomas Worcester, Pres. (no photo) — *William Davies, Architect*

NOTE:

The architects have acknowledged a special obligation to William W. Wurster, Dean of the School of Architecture and Planning, M.I.T., for advice and counsel

CHIEF CONSULTANTS

George Willard Smith,
Pres., New England Mutual Life Insurance Co.

James A. Killian, Jr.,
Pres., M.I.T.

A. C. Willauer,
Architectural Consultant to New England Mutual

D. P. Appell,
Vice-Pres., George A. Fuller Co.

Burnham Kelly,
Director of Bemis Foundation at M.I.T.

MANAGEMENT CONSULTANTS

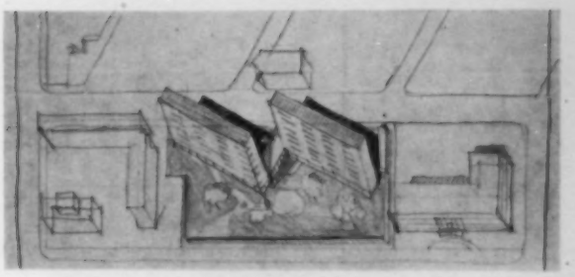
Richard J. Olds
(New York)

Charles N. March
(Boston)

"EASTGATE" APARTMENTS AS A FRESH PLAN TYPE

For the New England Mutual Life Insurance Co.

and Massachusetts Institute of Technology



INVESTMENT SAFETY DEMANDED IMPROVED PERFORMANCE

A SAFE long-term investment was what New England Mutual Life was looking for. In the field of rental housing, especially, it seemed to shrewd President George Willard Smith that safety lay in being ahead of the procession.

In this field (opened to life insurance companies in Massachusetts by 1945 legislation) high costs could be recovered and written down only by prolonged high-class demand, staving off obsolescence.

In March 1947, when A. Osborne Willauer, architectural adviser employed especially for housing research, discovered that Massachusetts Institute of Technology desired faculty housing, the directors saw opportunity. M.I.T. was another solid institution; it exercised an enormous attraction as a cultural center; its site on the Charles River Basin was superb.

Of more general significance to architects was the reasoning which said that "joining forces with M.I.T. would enable the best technical brains in America to go to work on this particular project." Early May, 1947, a sketch (above) by Vernon DeMars of the M.I.T. architectural school had been checked by Vice-President David Appell of George A. Fuller Co. acting as consultant. Mr. Appell's cost estimate, if prorated to final number of apartments, was 5 per cent higher than Fuller's present guaranteed cost for the finished building. On recommendation of Dean W. W. Wurster of the M.I.T. School of Architecture and Planning there was set up a collaborative planning method. A group of imaginative young staff members were to act as architects and planners; the old and experienced engineering firm of Thomas Worcester, Inc. furnished engineers plus the wise trained mind of William Davies, its own architect; and the insurance company was represented by far-seeing and tactful A. O. Willauer, its home-office architectural adviser. Richard S. Olds of New York and Charles N. March of Boston were called in as real estate management consultants.

The desire of the insurance client was that this, its first and prototype housing investment project, be based on something "pretty tried and true as to *future* demand." It was thought that analysis during the war "might have brought forth some new plans that had proved to be of service meeting housing demands elsewhere," and were "in advance of current thinking." On a 1938 trip abroad, President Smith had already looked admiringly — and carefully — at the many balcony apartments in Amsterdam and Stockholm; on talking with bankers and insurance heads in those cities he had discovered that a great many of them lived personally in just such apartment dwellings, finding them eminently practical and livable.

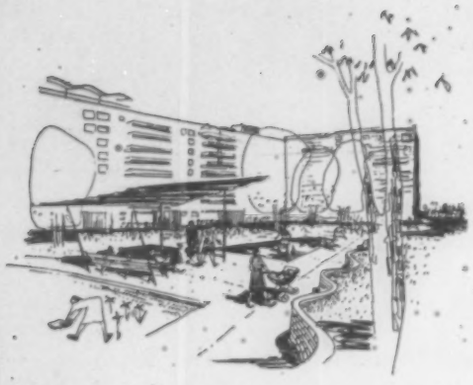
Instead of selling the land, M.I.T. leased to New England Mutual, for 60 years, a 2⅓ acre tract at the eastern end of its campus — hence the name "Eastgate."

Analysis soon established the desirable size in the range of 1000 rooms; and on this particular site, city planners gave this high density their approbation (page 112). How the plans ultimately developed may be studied on succeeding pages.

Meanwhile New England Mutual had done its own research on investment housing. Compared to bond investments, rental housing has a procession of management problems associated with it, justifying higher returns. High building costs tend to cut these down. The splendid site, the assured sources of occupancy, and expert planning "in advance of current thinking," could offset many managerial problems but not the high costs. New England Mutual decided to reduce their effect by a high rate of amortization during the initial period. In other words, the company would restrict its earnings during that time to a rate about midway between the returns on government bonds and superior private bonds, and devote the remainder of its cash income to writing down book value. (In current figures, this would seem to indicate earnings of about 3 per cent, between the normal 3½ per cent rate on good bonds or 2½ per cent on government bonds.) After perhaps ten years of such amortization it would therefore be possible to lower rents and still obtain a justified return with safety.

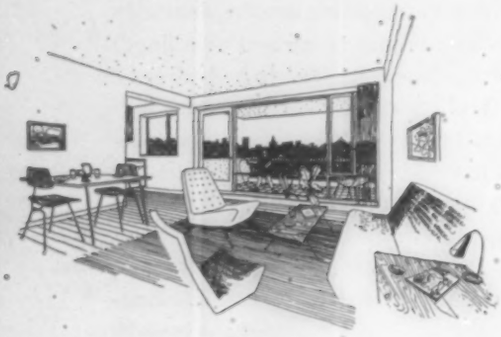
Photos of Killian, Smith and Willauer by Bachrach; photo of Koch by Ezra Stoller.

ARCHITECTURAL OBJECTIVES GUIDED ALL THE PLANNING



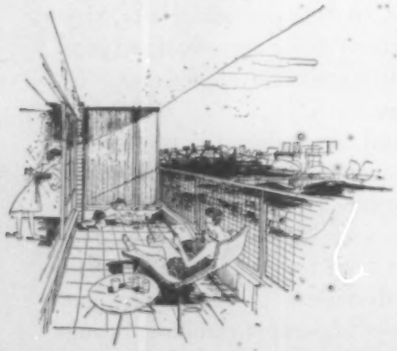
1. OUTDOOR LIVING

—was carefully developed in close conjunction with indoor living, by careful treatment of grounds and roof space, and by a balcony off every living room, pulling in the distant sky



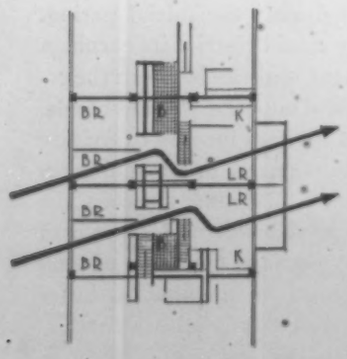
2. SUN AND VIEW

—fortunately were on the same side. The aim was to obtain direct sunlight for every living room, dining space, kitchen, during a large share of the day; and to give every apartment at least one view extending well beyond adjacent buildings.



3. PRIVACY AND SPACIOUSNESS

—were sought by a building shape that opened up all "re-entrant angles" where neighbors might face one another across a corner; and by apartments in the best tradition of open planning



4. THROUGH VENTILATION

—was assured, for a majority of apartments, by the absence of corridors on two floors out of three. No other plan type has yet been developed capable of giving this advantage to so many occupants at moderate rentals

5. OPTIMUM STORAGE FACILITIES

—were sought for in the building plans, to permit the family conveniently to store its car, its baby carriage, and other necessities of family life

6. SIMPLE CONSTRUCTION

—was sought through repetition of standard bays, with a minimum of turns and angles in the building plan. Because apartment plans differed on the corridor floors from those on non-corridor floors, the vertical alignment of service elements required extra thought

7. CODE AND ZONING COMPLIANCE

—were essential in a scheme that was anything but academic. Actually, the architects were able to design their scheme to the Cambridge code without being obliged to make a single appeal

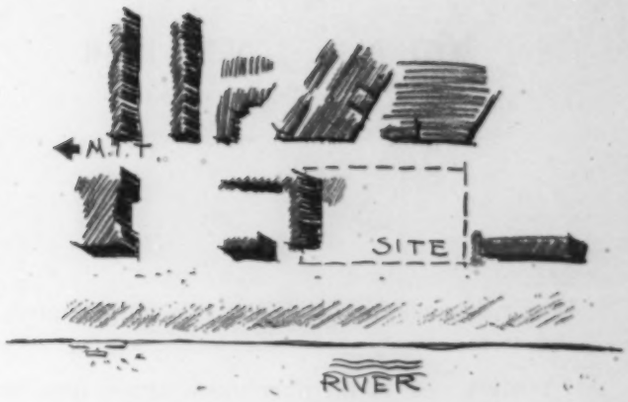
8. SPECIAL NOTE ON CODES

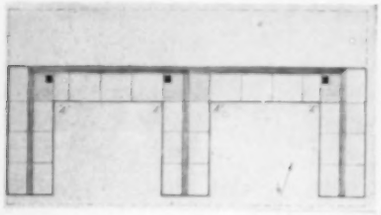
Requirements affecting the "skip-floor and access corridor" type of plan vary considerably from city to city. On page 124, Julian Whittlesey outlines a code revision, which architects can submit where needed

PRELIMINARY SITE STUDIES—SUN AND VIEW FOR ALL

Among schemes studied and rejected on this particular site are some with more than local interest.

The site offered a unique river view. This, however, merely gave the architects a still stronger incentive to do what was right anyhow. Rigorously excluding all north exposures for any living room, and refusing to accept any north wing of the building that would be shaded by an east-west wing, they obtained not only a generous river view for every occupant but also a generous share of direct sunlight.





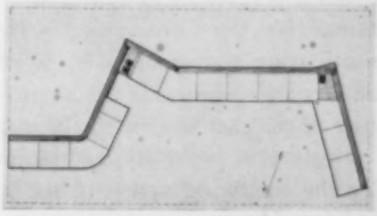
"E"

(A conventional plan, for study purposes only; corridors on every floor)

FOR: Large number of apartments

AGAINST: West wing too close to dorms
Lack of privacy at re-entrant angles
Apartments face each other across courts
No through ventilation for the courts
Large waste areas at junction of wings
Garden areas completely cut apart
Orientation only fair
Character institutional, not home-like

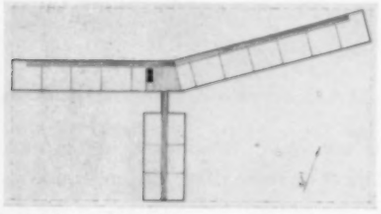
"M"



(For study purposes only; skip-floor)

FOR: Good orientation, privacy
Excellent view

AGAINST: Small number of apartments
Use of side-corridor throughout scheme
results in 2-BR apartments on all non-corridor floors, yields too high a proportion of large apartments for the program. (In later schemes, this is offset by inclusion of some central-corridor wings with higher proportion of smaller apartments)

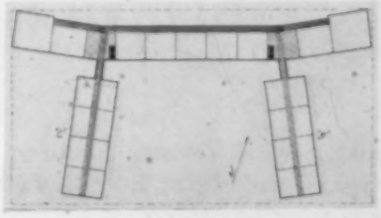


"T"

FOR: Good view
Fairly good orientation. Fair balance between 2-BR and 1-BR apartments
Breezeway improves summer ventilation, interconnects gardens, improves privacy

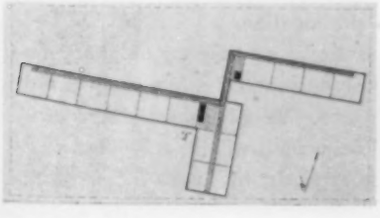
AGAINST: Small number of apartments

"T-T"



FOR: Higher apartment count
Good balance between number of 1-BR and 2-BR apartments

AGAINST: No central lobby or control point
Inadequate garage and parking at north
East ap'ts in right leg face away from river view; no sun after 9:30 a.m.
West ap'ts in left leg are too close to broadside of adjacent dorm

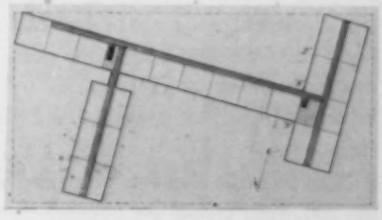


"L-I"

FOR: Good orientation
Good view

AGAINST: Small number of ap'ts created
No through ventilation for western court
Lack of privacy for ap'ts at re-entrant angle of main wing
No connection between garden areas

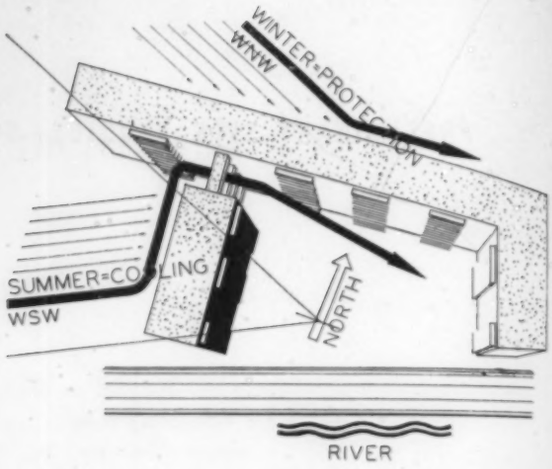
"T-L"



FOR: Adequate number of ap'ts
Main block and south wing O.K. as to sun, view, privacy

AGAINST: Little or no sun for some ap'ts at top left of east wing
Poor view from same ap'ts
Lack of privacy at re-entrant angles between main wing and east wing

FINAL PLOT PLAN SCORED HIGH



Listing the qualities of the site plan finally accepted, the architects were able to balance as follows:

FOR: A view of the river was obtained from living rooms of all apartments.

Sunlight to all apartments.

Good privacy at junctures of building wings was obtained by the "breezeway" connection between the south wing and main wing, giving greater separation; and by the openness of the re-entrant angle at the juncture of the east wing with the main wing.

Protection provided against northwest winter winds by the sheltering action of the main wing, which has only corridors or bedrooms to the north, not living rooms.

Cooling provided by southwest summer winds, passing to the east court through the breezeway.

Gardens are interconnected by the breezeway (see sketch on page 114).

Adequate number of apartments provided in relation to demand and to requirements of financing.

Balance of 2-bedroom and 1-bedroom apartments falls well within the set program.

AGAINST: The river view is oblique from six small corridor-floor apartments at the northeast end of the east wing.

The junction between main wing and east wing causes non-typical plans and framing.

DENSITY WAS CHECKED BY PLANNERS

Like any tall elevator apartment plan, the skip-floor type of plan used at Eastgate should be used sparingly and never be crowded on the land. To make sure they were on the beam, the architects asked for opinions of professional city planners. The answer of Roland Greeley is reproduced in full:

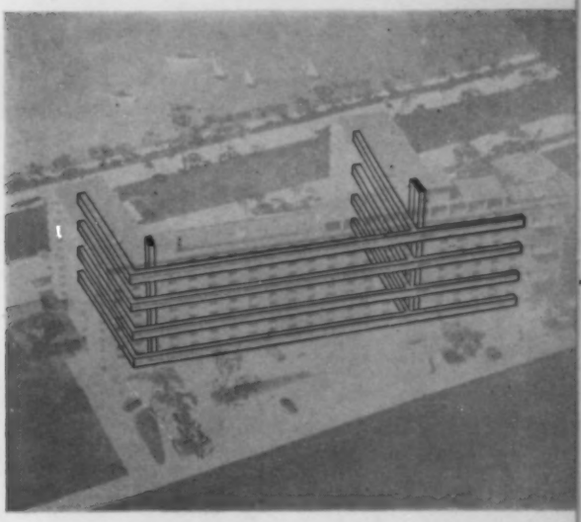
"The general concept of neighborhood-wide densities is scarcely applicable at Eastgate because: 1) the controllable site of about two acres is too small to afford most neighborhood requirements; and 2) the occupants of the site, and of the surrounding area, comprise a far from typical group, both because of total number and because of family composition.

"Of the basic elements which control neighborhood density the following *cannot* be applied directly:

1) Playfield space, for teen-agers and adults. Eastgate occupants will presumably use M.I.T. facilities.
2) Playground facilities, primarily for elementary school-age children. The relatively few children in this age group will have to use M.I.T. facilities or be transported to Magazine Street or some other distant area. As a playground should be at least three acres, on-site provision is of course out of the question.
3) School, public building and shopping facilities. The total population in the Eastgate area could not possibly support such facilities, beyond a minimum of retail stores, such as are contemplated. Such possibly sub-standard conditions as transportation to school are inevitable because of the site location.

"Of the other basic controls on neighborhood density, parking and circulation can be adequately cared for within the existing site plan. The only other basic control is that of light and air. Whether this will be adequate seems to be a question only as regards the lower rooms on the Amherst Street side, and the answer is primarily dependent upon dwelling unit design, and control of what is done north of Amherst Street. If reasonable standards of light and air are assured, I believe the other standards are well cared for to the extent practicable."

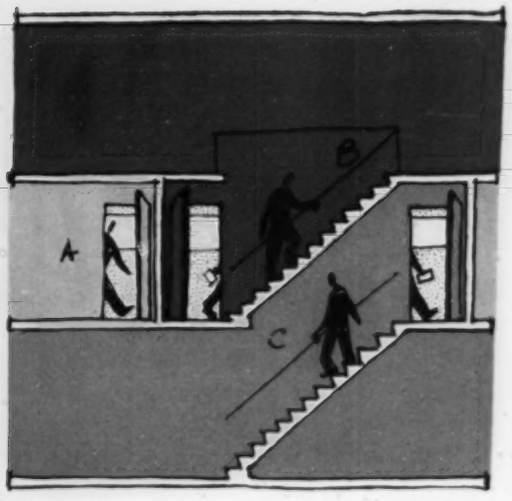
A SKIP-FLOOR CORRIDOR SCHEME HAS FOUR COMPONENTS



RIGHT

1. Elevators stop only at intermittent floors, where there are long access corridors

At Eastgate, corridors are introduced at every third floor. Object: to cut down public corridor area and gain efficient use of expensive elevators



LEFT

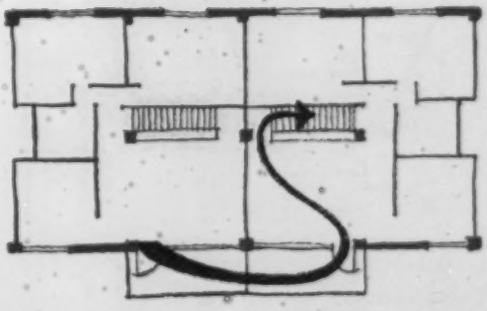
2. All occupants leave elevator on the corridor floor. Those living on non-corridor floors use auxiliary private stairways, going up or down

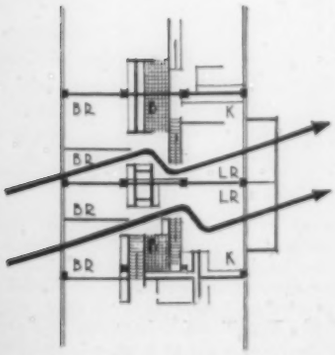
At Eastgate, auxiliary stairs are inside the apartments. All vestibules are on corridor floors, are easily found. Interior stair gives apartments more air, more apparent space; relieves owner of maintenance of public stairs

BELOW

3. Non-corridor floors extend from exterior wall to exterior wall, have privacy and through ventilation

(At Eastgate it was found simpler to provide only simplex apartments, all on one floor. In some locations the scheme could be worked with duplexes or interlocking 1-floor, 2-floor units)

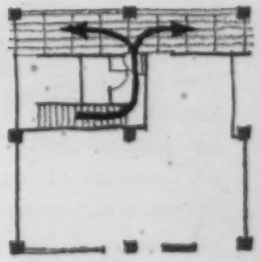




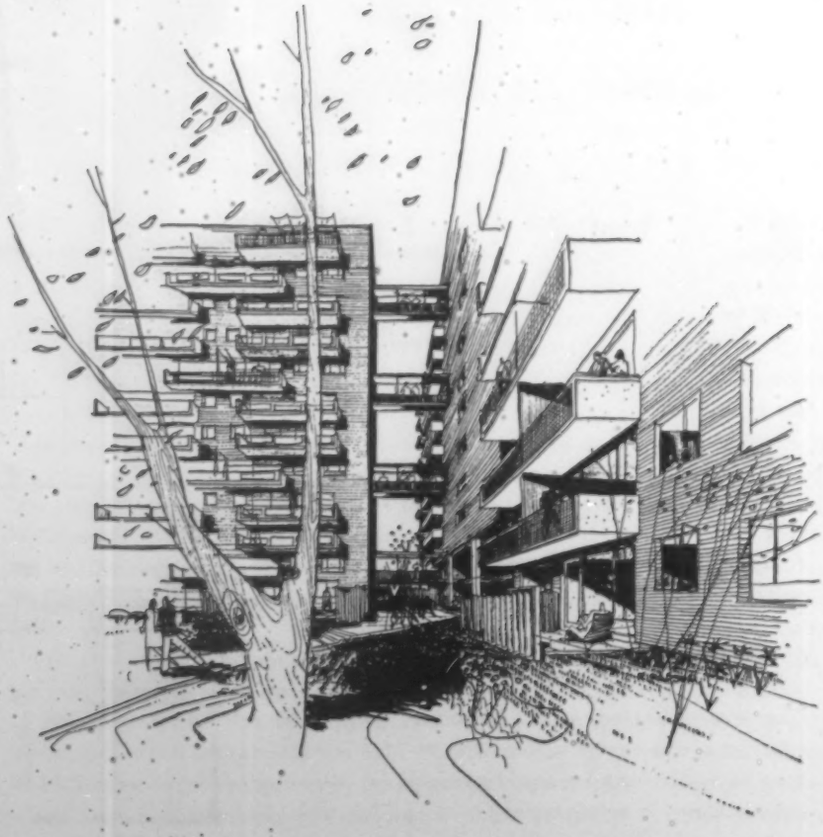
RIGHT

4. Secondary means of egress must be provided

At Eastgate the balconies, which serve pleasant living, double (on non-corridor floors) as emergency exits. The occupant, on a non-corridor floor, can escape to a corridor by way of his neighbor's balcony, in emergencies



Renderings by Ralph Rapson



EFFICIENCY STUDIES AND COST ANALYSIS WERE USED TO DETERMINE WHETHER PREMIUM FACILITIES HAD INVOLVED A SACRIFICE

Statistical "efficiency" is not the be-all and end-all of apartment house design, but merely a "hard-boiled" test of *selected factors*. Owners and architects of Eastgate used it to check whether any premium was being paid, in building cost or in space, for the premium standards that were set up in terms of sunlight, outlook, privacy, ventilation.

All concerned recognized the pitfalls in measuring tangibles against intangibles. ("How much sunlight equals how many square feet of floor space???")

To make certain of checking the "skip-floor" innovation, the toughest test was adopted, that of *"net rental area to gross area."* * This would surely expose any waste space attributable to the private stairways if these were not offset by the fewer corridors.

Rarely would a multi-story apartment show a net-to-gross, by this test, much in excess of 50 per cent. Around 60 per cent is possible in 3-story, in-line, walk-up plans. But in elevator buildings, as height and coverage increase, even 50 per cent is a good standard in actual experience; and by the time there is coverage of nearly all the ground, say on Park Avenue, New York, the net-to-gross might fall to 35.

For study purposes, Eastgate architects set up a comparison with a current New York cross-plan building, from a large insurance-financed project. To even out the "skip-floor" effect, a 3-floor slice from each of the two buildings was used for comparison.

Items	Eastgate	Current x-Type Bldg.
No. rooms (3 floors)	299	252
No. ap'ts (3 floors)	67	72
Av. rooms per ap't	3.4	3.5
Gross floor area	66,816	75,640
Net rental area	36,853	37,908
Av. sq. ft. per room		
Gross	292	300
Net	161	150
Net to gross	55.1	50.1

* *Tough because no credit is revealed for premium facilities such as extra closets where really convenient, extra bathrooms, etc. A second method, "gross rental area to gross area," has limitations in not exposing any wasteful amounts of hall space, or dark unusable foyer space, within apartments. A third method, "usable rental area to gross area," would include storage space, exclude unfurnishable circulation space. Though potentially revealing, this method is limited by the difficulty of precise definition and measurement of "usable" area.*

Such tables convinced the architects that no premium had been paid, under their plan, in return for the intangible amenities — perhaps the reverse.

WOULD the forward-looking plan type used at Eastgate involve disproportionate costs? the owners asked their builders, the George A. Fuller Co. This builder was then completing a large insurance-financed project in New York State, involving two 13-story apartment buildings of superior merit using the cross-type plan. Actual costs of the earlier project were prorated to take account of a rising cost index, and were compared to the guaranteed cost for Eastgate, with results as follows:

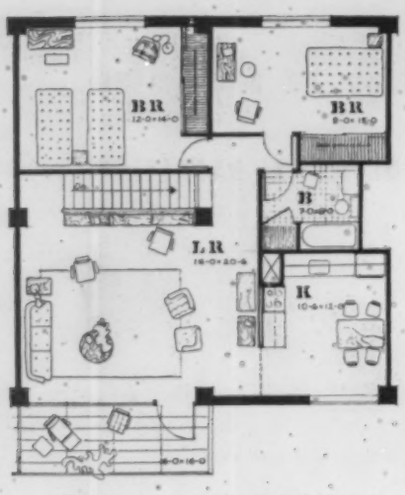
COST COMPARISONS, CROSS TYPE AND SKIP-FLOOR CORRIDOR TYPE

Cost Item	Per Construction Rm	Per Rental Rm
1. *Two 13-story insurance-owned cross-type bldgs.*, erected by Geo. A. Fuller Co. 1947–1948:		
Actual construction cost per room	$2809	
Prorated to Dec. 31, 1947, by Geo. A. Fuller Co.	3053	$2631
Prorated to Oct. 1948 by Dodge Cost Index *	3450	2971
2. *Eastgate* skip-floor and corridor bldg. including landscaping and balconies (balconies not counted as construction rooms). Excluding penthouses and garage, land cost, cost of piles, architects' fees		
Actual construction cost per room (926)	$3280	$3049

* *Cost indices show 13 per cent increase from Dec. 31, 1947 to October, 1948.*

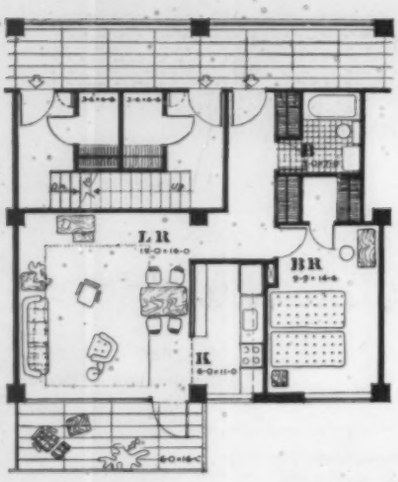
It would seem, then, even allowing for unforeseen contingencies, that the skip-floor plan can be built on fairly even terms, as to cost, with conventional plans. The chief difference which showed up was not in *construction cost* but in *development cost* (not shown in the table) due to the local situation. The discussion of such local features as the pile foundation is omitted in this general study of a building type. Suffice it that the magnificent scenic character and the location of the property offset this extra development cost as a market factor.

TWO BR APT



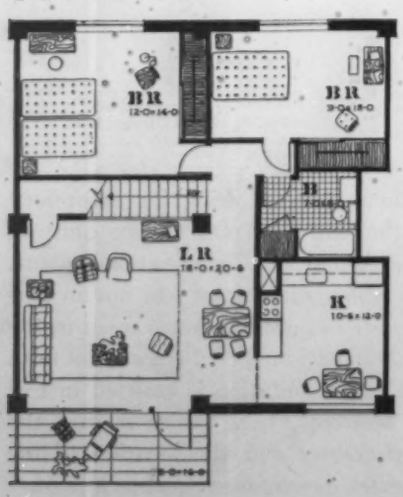
FL. ABOVE

ONE BR APT

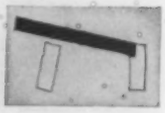


CORRIDOR FL.

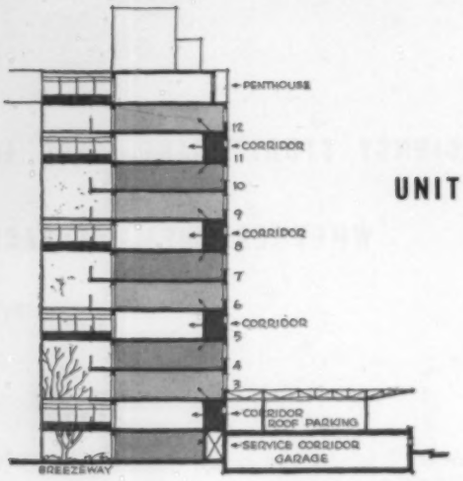
TWO BR APT



FL. BELOW



Main wing plans (side corridor)



UNIT PLANS WERE

DIVERSITY: Eastgate exhibits a variety of apartment types produced by (a) a skip-floor scheme, with (b) two orientations. The main wing apartments (shown on this page) result from *side-corridor and apartments with south orientation;* the "leg" apartments (next page) result from *central corridor and east-west orientation.* Six typical plans result, of which the above-the-corridor or below-the-corridor types are almost identical except as to stair landings. (Careful perusal of the general building plan will show additional variants produced by introduction of extra bedrooms and by special plans at the junction of the main wing with the east wing.)

BALCONIES: Without exception, every living room was faced on a livable balcony (on the ground floor, this was replaced by a private garden terrace). Separated from the living room only by a floor-to-ceiling glass wall, the balcony really extends the apparent living room, shades the interior against the hot summer sun.

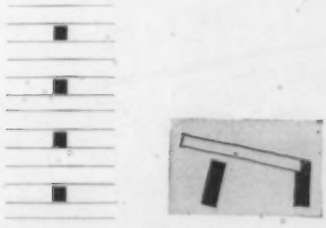
BROADSIDE EXPOSURE: Living rooms were given their long dimensions along the exterior wall, giving pleasant exposure, good light inside; "sitting" areas are out of the traffic paths.

DINING AND KITCHEN AREAS ON EXTERIOR WALLS: The sunny pleasant dining space is especially welcome compared to dark interior dining so often provided in apartment plans where the dining area is an interior passage.

The lack of direct kitchen access from the entry has been criticized; but the architects felt it was definitely more important to supply the kitchen with a view and natural ventilation (the latter is required by Cambridge code) and to place the kitchen door in such a way as to create the pleasant dining area just mentioned. These doors are to be large, sliding ones; when they are open the kitchen space is felt as part of the open planning, and the window adds another glimpse of the river from parts of the living room. (Note especially the "studio" apartment type, seen on the left-hand side of the middle plan on the opposite page.)

BEDROOMS were made generous in size, and so planned that beds need not face the windows or block access to wardrobes. These in turn were supplied with sliding doors, so that all the contents may be reached without the necessity of opening a closet door out into the room.

DEVELOPED FOR BETTER LIVING



West and East wing plans (central corridor)

STORAGE was treated as a special problem. The aim was to give every apartment ample unassigned storage space in addition to facilities for coats, linen, brooms and clothing. In the main wing the storage in vestibules is commendable, where occupants of apartments reached by stairs can leave heavier outdoor things. Elsewhere, storage has been provided either in the apartment or at concentrated locker areas.*

The apartment count is as follows:

29 3-bedroom apts	145 rooms	11%
108 2-bedroom apts	432 rooms	41%
95 1-bedroom apts	285 rooms	37%
28 studio apts	56 rooms	11%
1 penthouse apt	8 rooms	
TOTALS 261 apartments	926 rooms	100%

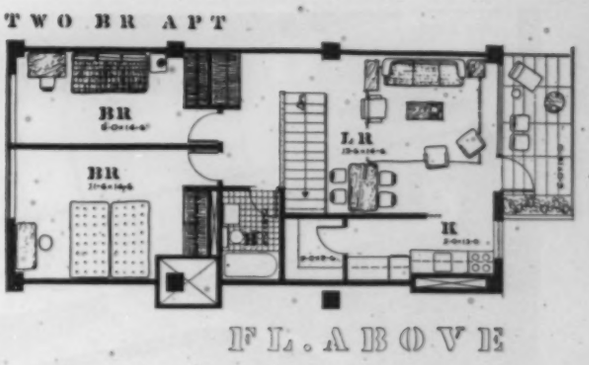
For rental rooms add 60 "rooms" for 240 balconies and 14 "rooms" for large dining spaces*

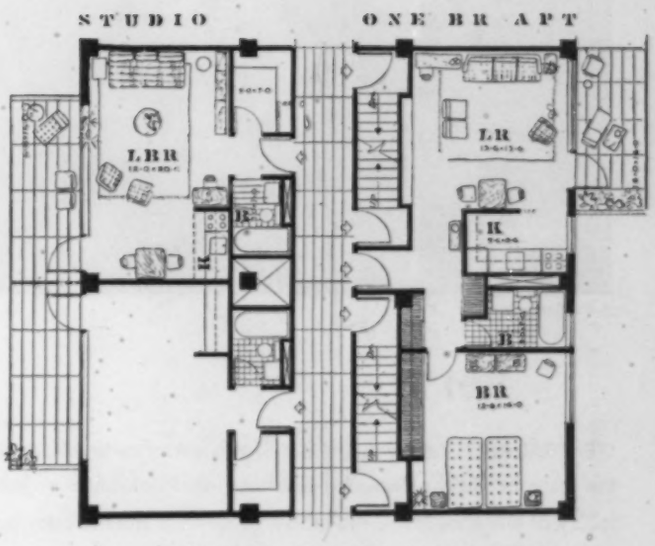
* *Recent refinements in unit plans have resulted in 233 apartments (89%) having general storage areas of at least 24 sq. ft. within the apartment. The 28 small apartments (11%) without this feature have been assigned storage lockers on corridor floors opposite the elevators.*

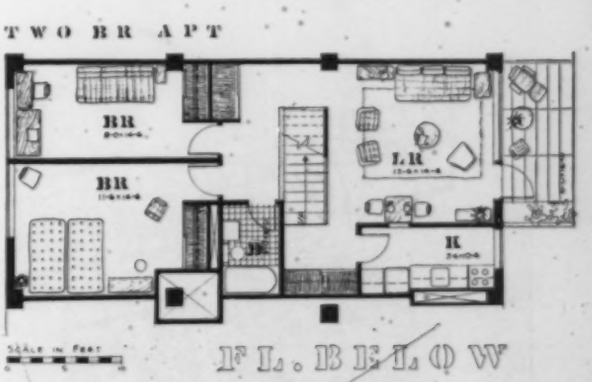
WHY NO DUPLEX APARTMENTS IN EASTGATE?

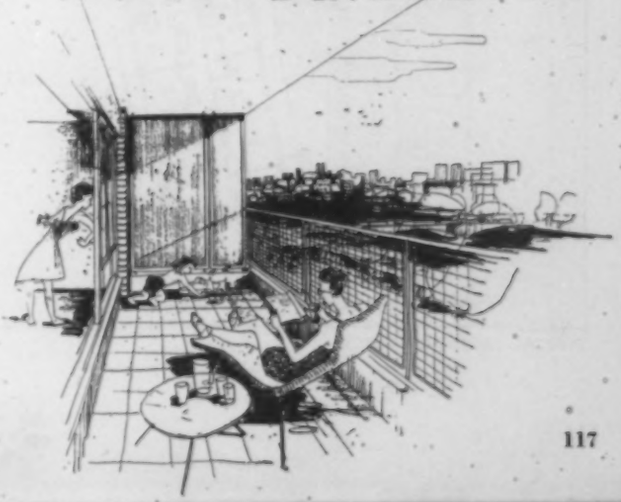
In a good many projects for "skip-floor" apartments drawn up on a theoretic basis here, and in apartments built abroad, there have been complex duplex plans interlocking with the single-floor dwellings.

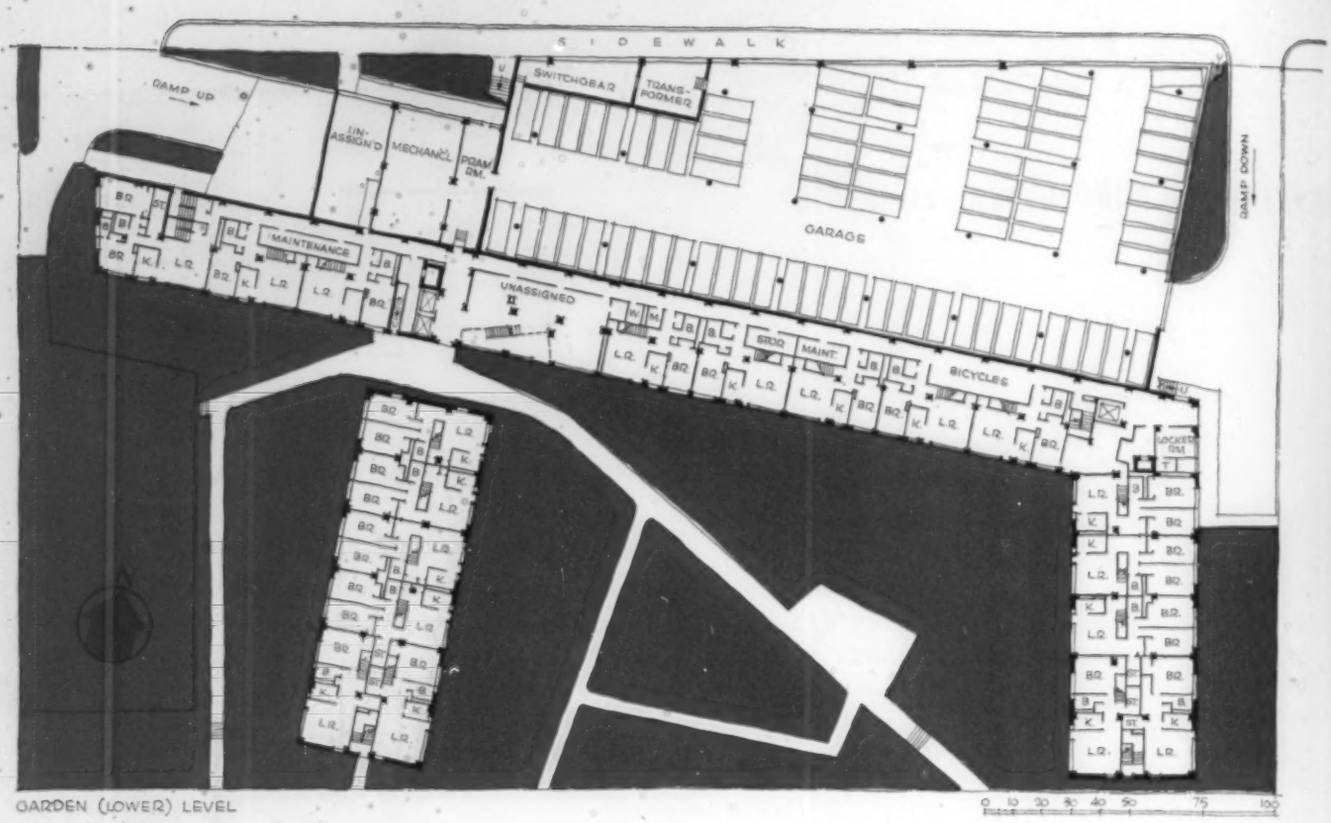
Such duplex plans were tried by Eastgate architects in the initial stages, abandoned for reasons some of which were merely local in bearing, some more general. The first, local, difficulty was the problem of secondary egress, as demanded by code, *from the second floor of a duplex plan*. Balconies would be an unjustifiable expense if they opened from bedrooms where they would have little other use. The second local difficulty was that duplexes would have produced too many larger apartments in relation to the demand at Cambridge. The third, general difficulty was the tendency of duplexes to produce unbalanced room sizes — bedrooms too large; living rooms too long unless kitchens were put in forbidden inside locations.





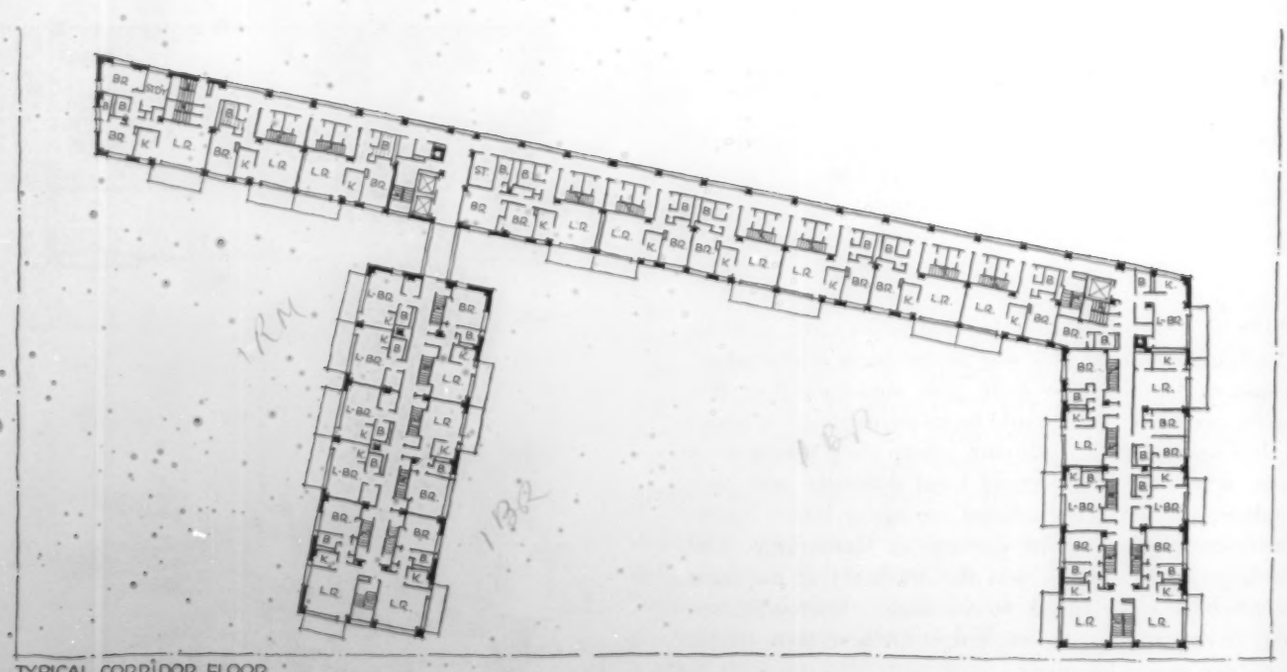




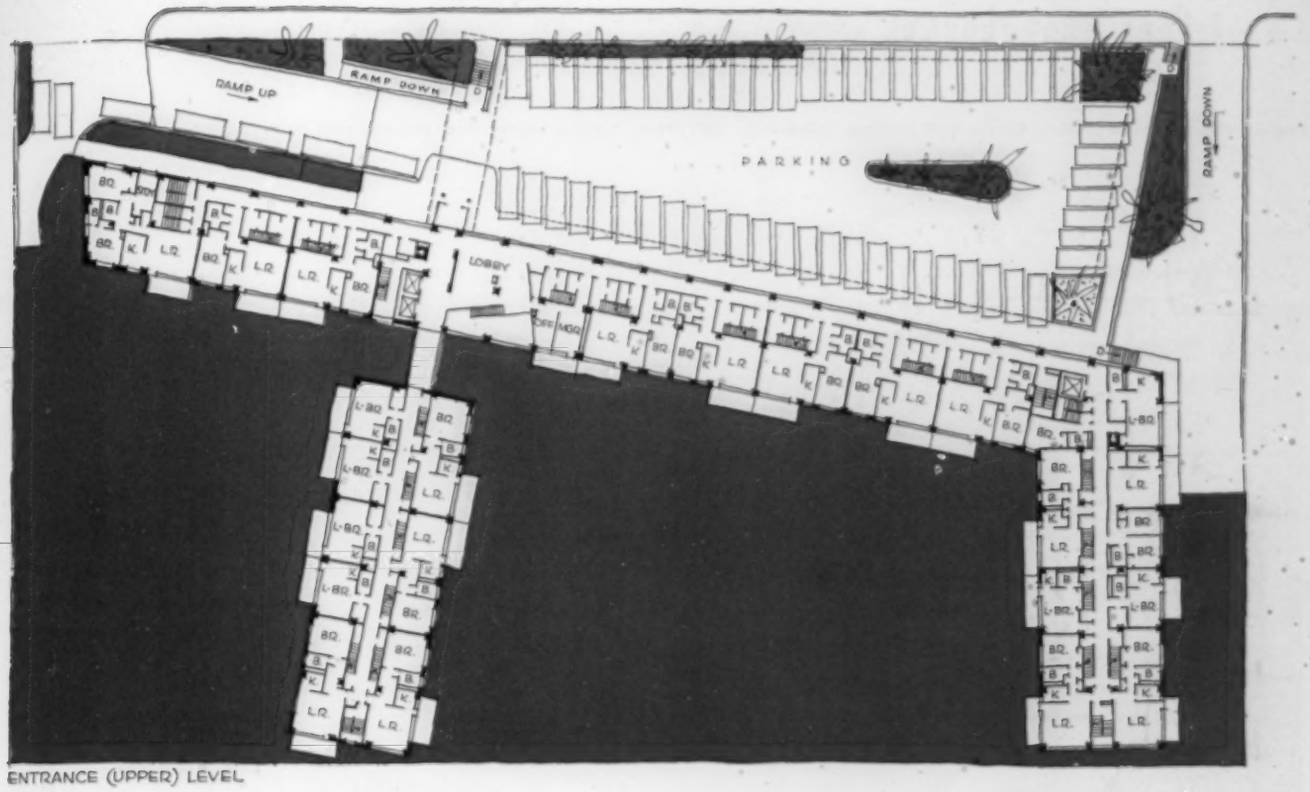


GARDEN (LOWER) LEVEL

GENERAL PLANS show the effect of two entrance levels. Access to garden apartments may be either direct from the garden at the south or via the entrance floor corridor. Vehicular access and direct foot access from M.I.T. are from the north to the main lobby at entrance level. The lobby, open from front to rear, has a stairway providing access to and view of the garden and river

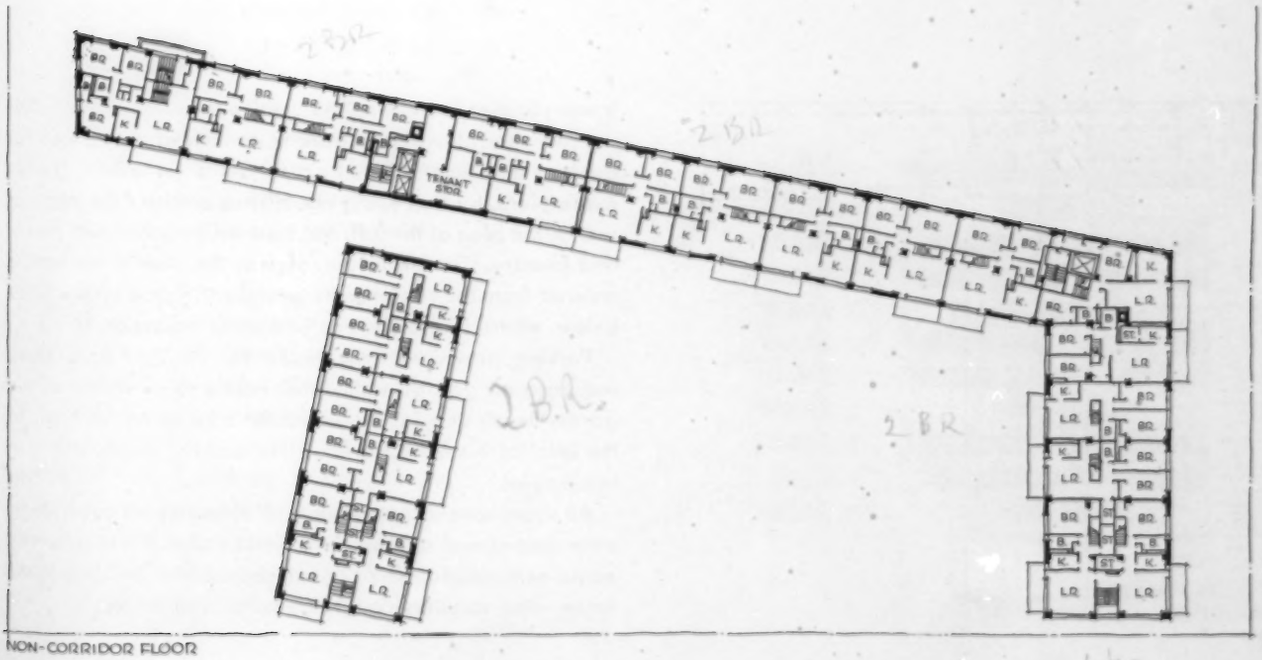


TYPICAL CORRIDOR FLOOR



ENTRANCE (UPPER) LEVEL

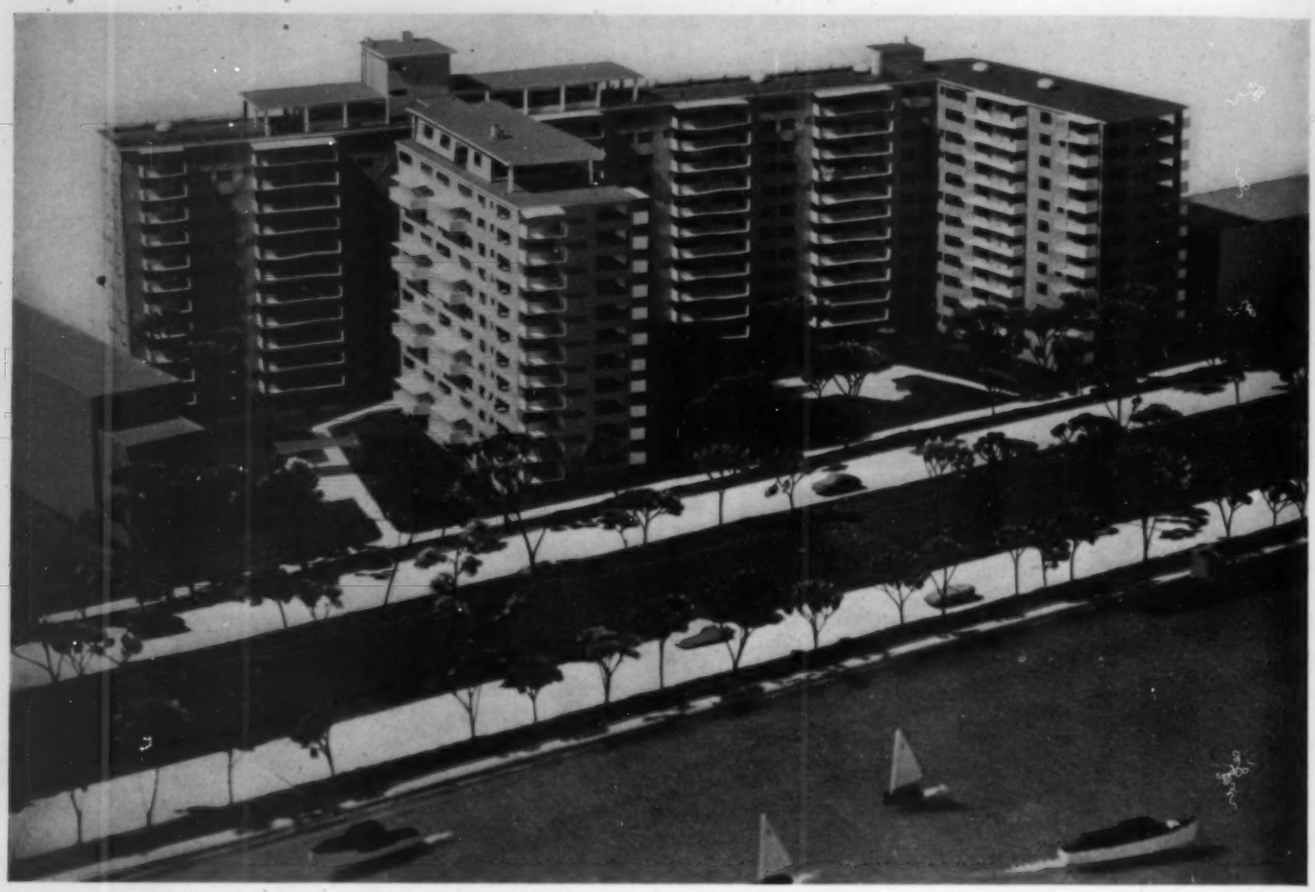
TYPICAL FLOORS (lower plans, opposite page and this page) include corridor plans and "skip-floor" non-corridor plans. Because the non-corridor floors are similar, whether above or below the corridor floor, only one non-corridor floor plan is shown. Note the inclusion of shopping facilities on the floor at garden level, to take care of tenants' needs not supplied in the neighborhood

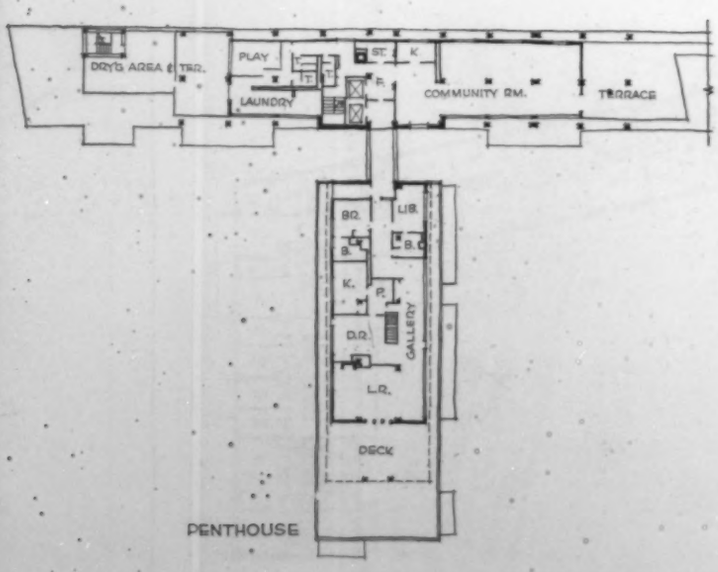


NON-CORRIDOR FLOOR

ROOF AND GROUNDS WERE AVAILABLE FOR SPECIAL USES

First of all they served outdoor living; then parking, community gatherings, nursery supervision, services such as laundry





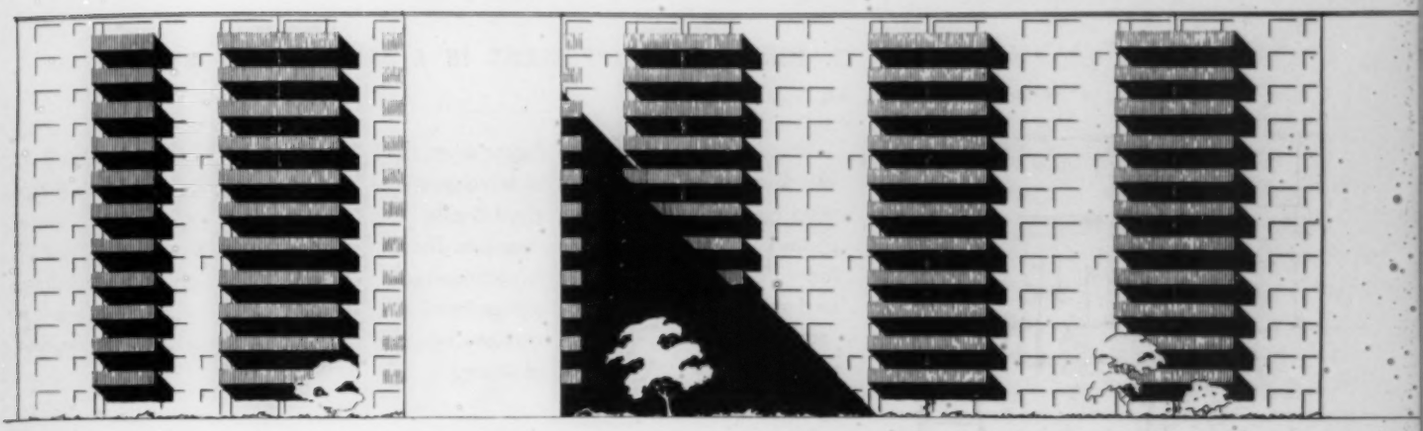
It was planned to develop the area to the south of the building (see view above) as a garden, containing play areas for children and quiet shaded sitting areas for adults. (Landscape plans, by Dan Kiley, are in preparation.) The roof, as seen in the plan at the left, can be used for community rooms and laundry. (The penthouse, seen in the plan to the left, is entered from the roof, has its secondary egress on the floor below, where it also has two bedrooms belonging to it.)

Parking provisions were made for 75 cars in a semi-underground garage with direct access to elevators at the garden level; and for an additional 65 cars on the roof, at the level of the entrance floor (see building plans, previous two pages).

All these special provisions and amenities of good living were considered a good investment value. Their presence would help maintain the attractiveness of the building in the future when conditions might be more competitive.

BALCONIES WERE AN INTERESTING PROBLEM IN DESIGN

SOUTH ELEVATION—MAIN WING



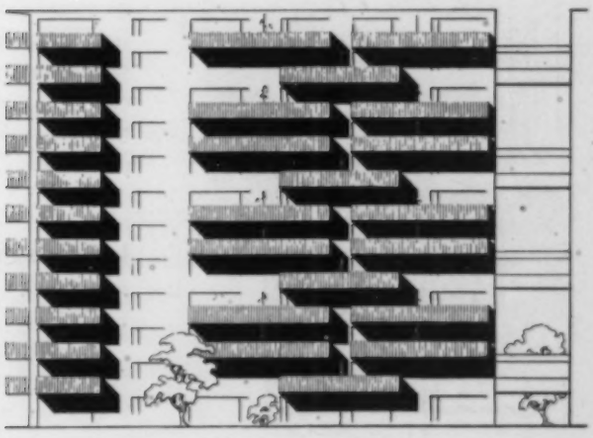
COST OF BALCONIES AND INTERIOR STAIRS

In pro-rating the cost of balconies (among the 240 apartments having balconies) a net construction cost was used, which included balconies and canopies but excluded fees or the provision of a door. This yielded a cost of $340 per apartment having a balcony. (The area of 6 by 16 ft. per balcony, or a total of 25,630 sq. ft., was not added in computing the area of the building, but each balcony was called a "¼-room" in computing the schedule of rental rooms.)

The net construction cost of interior stairs, again excluding fees, was put at $168 apiece.

Two planning factors affected strongly the arrangement in elevation of the balconies, which are so powerful a factor in the design. The first was the desire that the balconies serve as literal and visual extensions of the living rooms. The second was the function of the balconies in supplying secondary means of egress.

In general, the effort was made to stack rather than stagger the balconies, since each balcony in a stack would protect the next against sun and weather; moreover there would be no opportunity for neighbors to look down and across into adjacent balconies. Nevertheless the east and west wings required a different treatment, with occasional staggering of balconies to meet the requirements of egress.

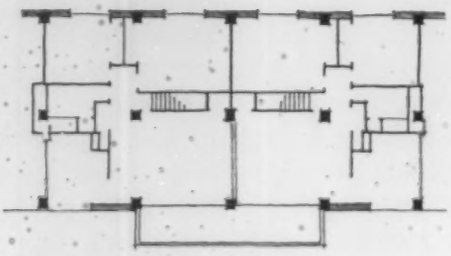


EAST ELEVATION—SOUTH WING

THE PLAN INVOLVED STRUCTURAL ADAPTATIONS

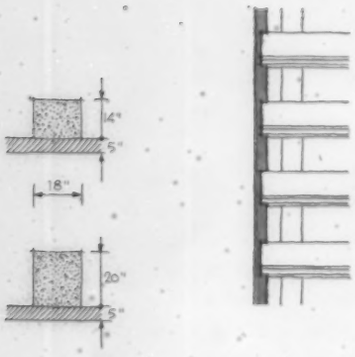
(described by Frank K. Perkins, structural engineer with Thomas Worcester, Inc.)

Several structural problems are inherent in the design of a building that is basically a thin vertical slab, with balconies as an essential design element and with alternating floor plans. (Concrete was use used for economy and less height)



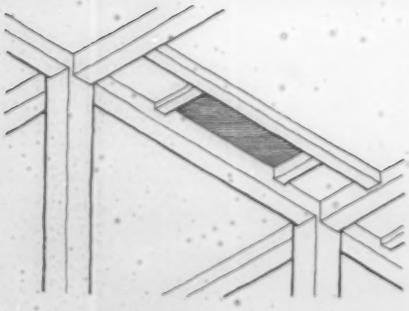
1. WIND BRACING PROBLEMS IN A TALL, NARROW BUILDING

Wind bracing becomes a factor when the ratio of height to width exceeds 2.5. The columns and beams would have become too large in the lower floors if the wind had been carried by "rigid frame" design. In addition, cross beams were undesirable for architectural reasons. Therefore, diaphragm walls carry most of the wind load. These are reinforced concrete, extend the full height of the building, and act as partition walls as well as bracing walls. In the expansion joint there is a "saw tooth" connection which allows movement in the longitudinal direction, but which picks up transverse wind shear.



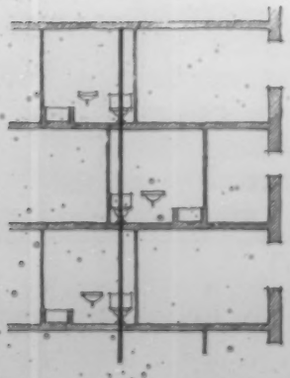
2. COLUMN DESIGN WITH BALCONIES IN VERTICAL ALIGNMENT

There were several angles to the design of the columns. Even without wind load, columns became large on the lower floors; so 4,000 lb. concrete and hard grade steel are used for all columns below the ninth floor. The exposed face of the exterior columns had to be vertical where the balconies were aligned, so a constant dimension was held along the face of the building with the depth being reduced for the upper floors. This resulted in some eccentricity, but interior columns were concentric in almost every case.



3. FLOOR DESIGN IN A STRUCTURE WITH MANY STAIRS

The final framing of the floor system was a compromise. An influencing factor was the desire to have the bottom of the slab act as a ceiling, with a smooth surface that could be tinted without plastering, and with a minimum number of breaks. Rib construction was out for this reason, and flat slab design was dropped on account of the size and location of stair wells and other floor openings. The final selection was a series of one-way slabs on the south side of the main wing and two-way slabs on the north side. There are longitudinal beams down the center line of columns with cross beams on the north side that assist in framing the stair wells. The balconies are cantilevered over the spandrels from the living room slabs.



4. PROBLEMS OF PIPES AND SERVICES WITH VARIED FLOOR PLANS

The difference in the layout between corridor floors and non-corridor floors caused a problem in plumbing services. The bathrooms could not be aligned, so that it was necessary to hold one main stack with the other fixtures to the north in some cases and to the south in others. The general design of the building caused a great concentration of electric, steam, plumbing, and other services; so a pipe gallery is being installed under the first floor to distribute the heavier service pipes and conduits horizontally.

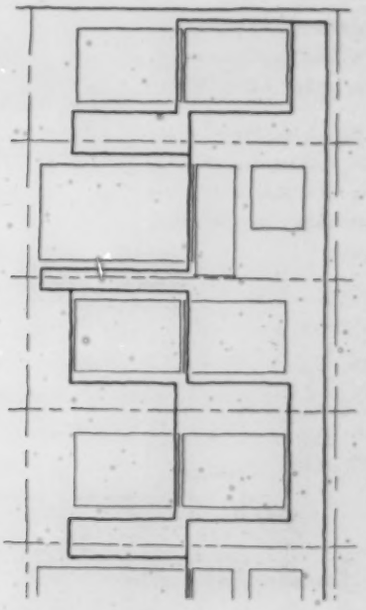
NEW HEATING DEVICES WERE DEVELOPED IN CORRELATION

(described by Charles A. Turner, Chief Mechanical Engineer, Thomas Worcester, Inc.)

In any structure, the heating system must meet the three tests of initial cost, operating cost, and tenant satisfaction. In the Eastgate scheme there was the added requirement that the mechanical equipment correlate with design

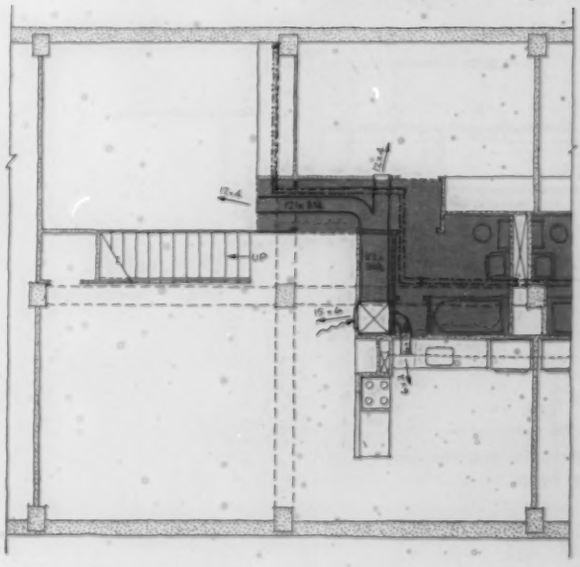
Outstanding in respect to first cost, fuel cost, and maintenance, was a system adapted from the "downfeed steam system." Steam is taken from the distribution mains under the first floor directly to the ceiling of the top floor of the building in uncovered risers, which are run exposed through bathrooms, corridors, and kitchens having outside walls and windows, and which provide the only heat for such rooms. At the top floor, branches run out from the risers along the outside wall, to a point above the living room and bedroom windows (see sketch). Each runout then crops into one end of a fin-tube convector. From the other end of the convector a line is dropped through the floor to the next convector in the floor below, and this is repeated until all floors are served. The system involves very few traps or valves. It is operated on a balanced sub-atmospheric steam supply with the amount of vacuum being controlled by an outdoor thermostat.

Unfortunately the system described involves exposed pipes, provides no automatic temperature control for each apartment; obstructs the outside wall.



Another method, now under consideration, is by no means basically new for residential use, but is unique in large apartment buildings. Essentially this is "individual forced warm air" using a complete unit for each apartment. *The source of heat for the unit, instead of being "direct fire," is a steam coil*, fed and controlled from central steam supply as before. The unit, consisting of steam coil, fan, trap, valve, and cabinet, will be in a recess located in each apartment (see sketch). Warm air will discharge from the top of the unit into a plenum chamber, created by a furred-down ceiling, out of which grilles will discharge the air into the rooms. Air return is through louvers in the bottom of the cabinet. Each apartment will be provided with a thermostat controlling the fan with off-on action.

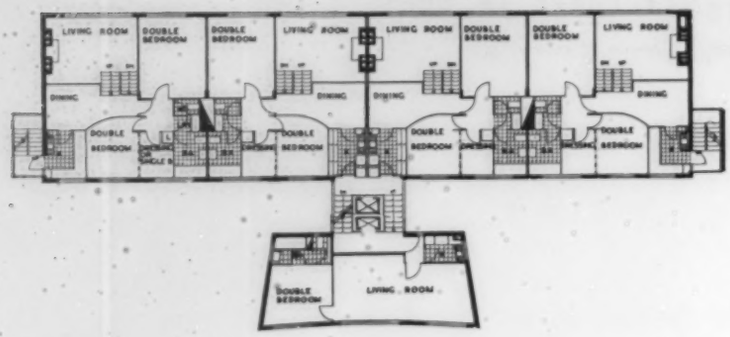
Tested by mock-up, this system shows a possible increase in installation cost over the other system, and somewhat increased maintenance costs; but these factors are more than compensated, it is thought, by tenant satisfaction because of individual apartment control; by operating economy through such control; by non-interference with pleasant living arrangements.



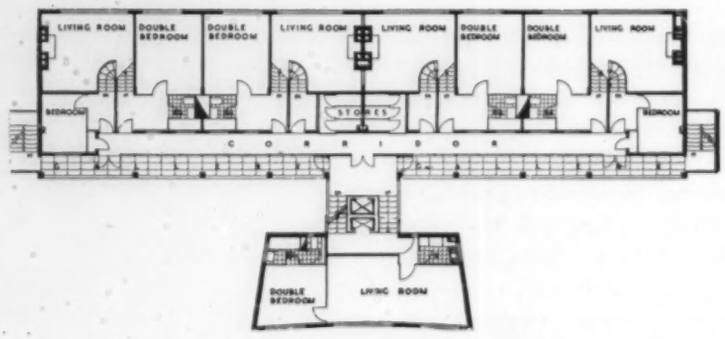
THE SKIP-FLOOR CORRIDOR

1. NATURAL VENTILATION
2. ORIENTATION
3. ECONOMICAL SITING AND SLOPES
4. ECONOMY OF ELEVATORAGE AND PUBLIC HALLS
5. ARCHITECTURAL MASS

UPPER



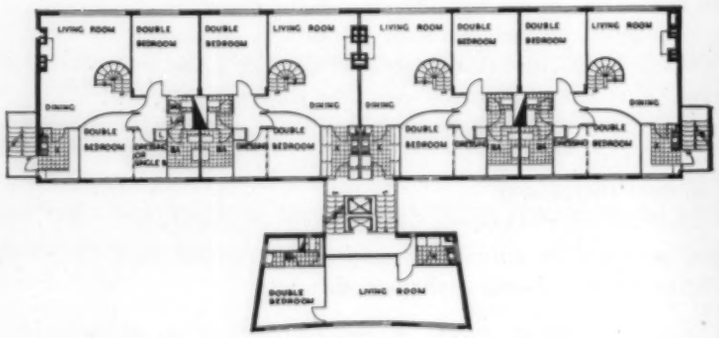
MIDDLE



Handsome luxury apartments by WELLS COATES, at Palace Gate, London. Built in 1939

All through ventilation duplex in the main building. 1½-story living room. Side corridor and access gallery each third floor. 8 stories

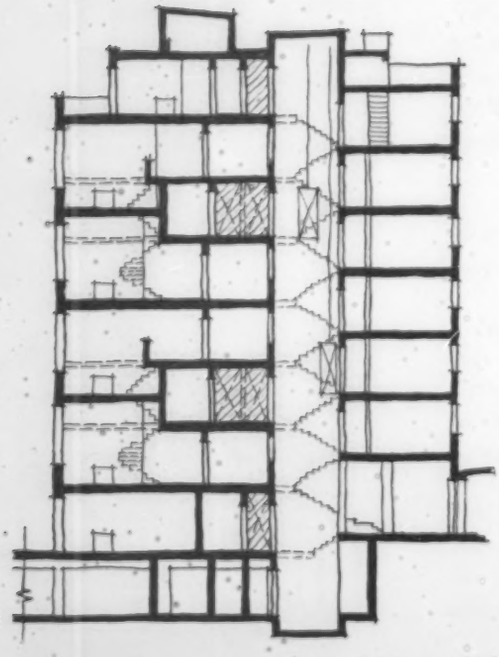
LOWER

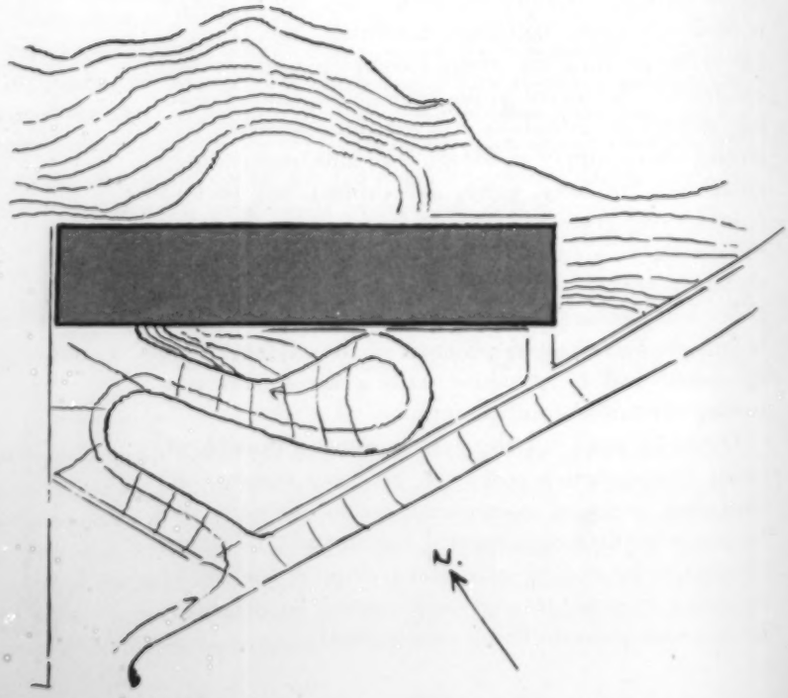


UPPER

MIDDLE

LOWER





To the right is shown siting of OSCAR NIEMEYER'S resort hotel on a steep slope in Ouro-Preto, Brazil. Built 1943

BUILDING TYPE SERVES A FIVE-FOLD PURPOSE

By Julian Whittlesey

ARCHITECTS have been driven into a tiresome epoch of cross-shaped, H-shaped and Z-shaped plans in their search for various economical ways to build multi-story apartments, having due regard for corner ventilation, if not through ventilation; and for a low ratio of elevators, public stairs and public halls for a given number of apartments; but with little regard for topography, orientation and the architecture of the mass. The fact is that these shapes by their nature can pay only slight heed to topography and orientation.

The ubiquitous cross, double cross and H buildings (up to 14 stories in our public housing projects) generally score the highest economy. Z plans, more shapely in mass, more adaptable to topography, and more amenable to orientation and composition, have run second in the economy race, being best used up to six floors and best limited to 4 or 5 apartments per floor. Hence they are often reserved for the larger apartments.

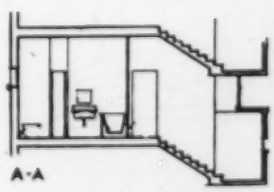
Such distinction as these simple shapes can have is often lost when they are complicated by additional breaks and protrusions resulting from the pressure to add one more room per floor, and to reduce the average gross area per room from say 200 sq. ft. per room to 198 sq. ft. per room.

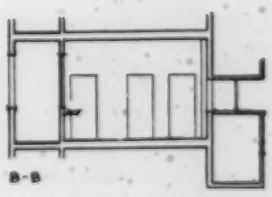
Some mixtures, of crosses and Z's for instance, have proven good, especially where the latter is kept lower than the former and possibly connected with it. The Z offers some directional feeling in site composition — besides some height variation. At best these agglomerations of multi-story cross, H and Z buildings leave much to be desired in site planning — not to mention in orientation and economical use of sloping topography. Often these agglomerations are a disease.

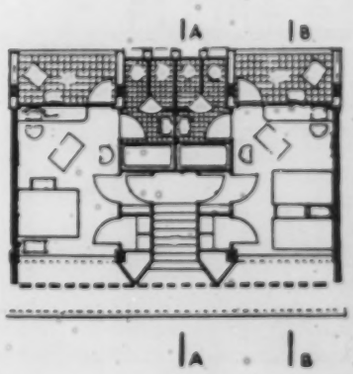
A way out has long been sought in the skip-floor corridor plan types which offer a long slim building meeting all of the above considerations of ventilation, orientation, topography and mass. This is not a recommendation for exclusive use of the long, strip building in a large site. Its virtue may lie rather in occasional use. Furthermore the inclusion of all of a required range of apartment types in this type of plan can lead to great difficulties and compromises within it.

The skip-floor corridor plan runs afoul of the usual building code provision that an apartment occurring on more than one floor have an exit on each. Some codes require two means of exit from the apartment. Others require, as in New York City, but one exit into a hall served by two exit stairs. Few codes will consider a stair within an apartment as being contributory to the exit requirements. Evidently Chicago, Cambridge, Milwaukee, London, Marseilles, and Motor City (Brazil) do — at least within some limits — otherwise we would not see examples built starting

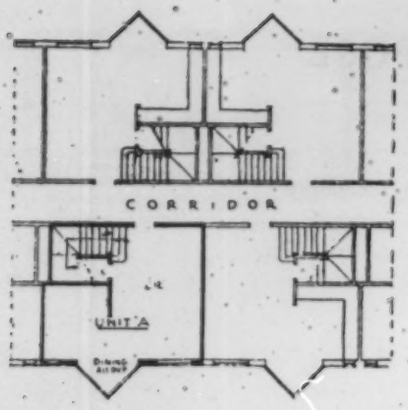
This was the first approach to the skip-floor corridor plan. Although the corridor does occur on all floors, Pingusson secured through ventilation and a good north view from his south exposed suites. The corridor has lower ceiling than the rooms and is kept about 9 risers below the suite floor. This permitted a window between the top of one corridor and the bottom of the other, and this forms a deeply recessed continuous window on the north side of each suite. The resulting elevation is also of interest

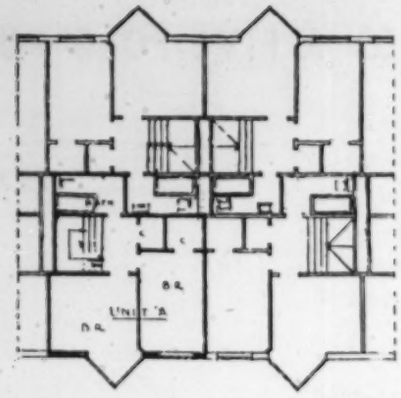




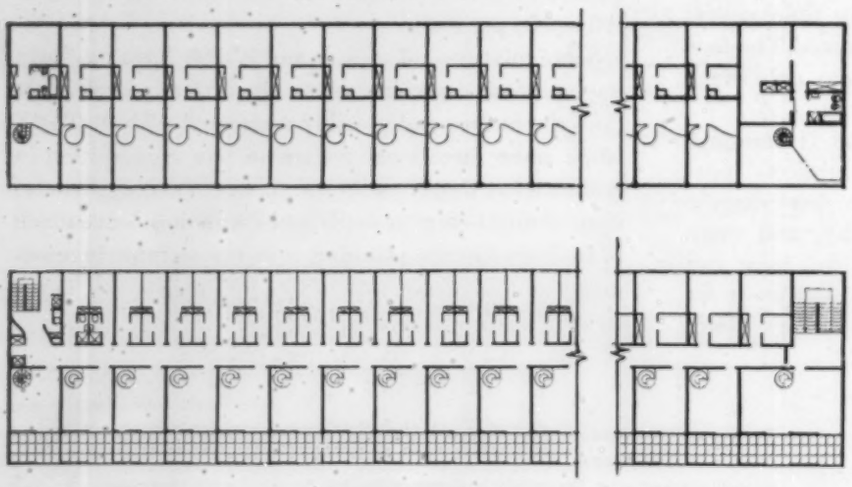


G. H. PINGUSSON's 10-story resort hotel at St. Tropez, France, built in 1933





H. TULLGREN's preliminary plan for a Milwaukee apartment house, has alternate floor corridor and single exposure duplexes. He claimed natural ventilation by air drawn into special bay windows. Plan as built in 1933 had through ventilation duplexes off a one side corridor on alternate floors

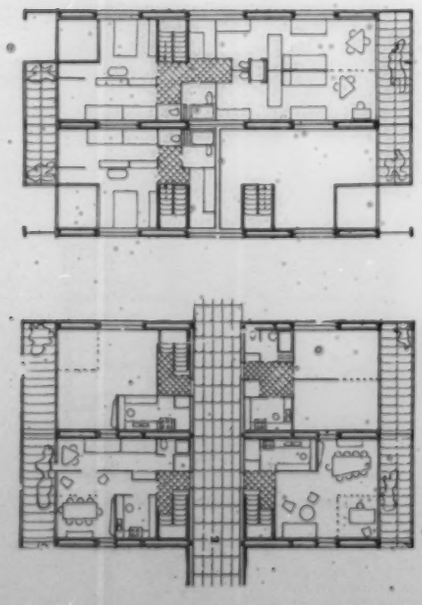


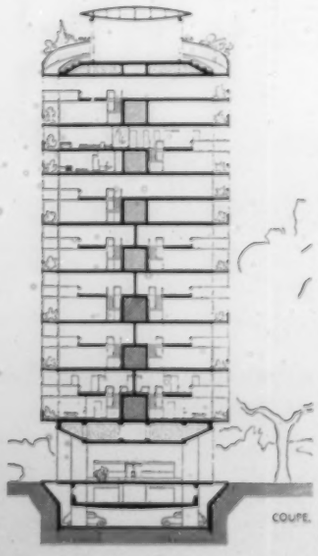
ABOVE

OSCAR NIEMEYER's resort hotel at Ouro Preto, Brazil, built in 1943, 3 stories, has through ventilation duplexes with 2½-story living rooms. Single exposure 1-room suites occur on the corridor floor.

BELOW

P. JEANNERET's recently proposed 14-story apartment building in Puteaux, France, does not take full advantage of through ventilation duplex, as he uses some which are duplexed to a single exposure.

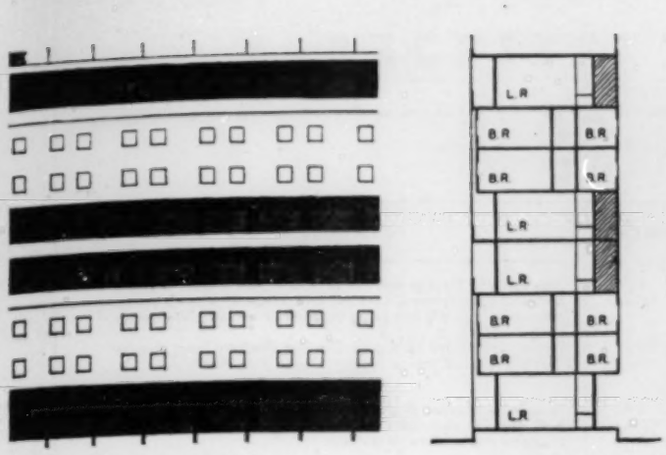




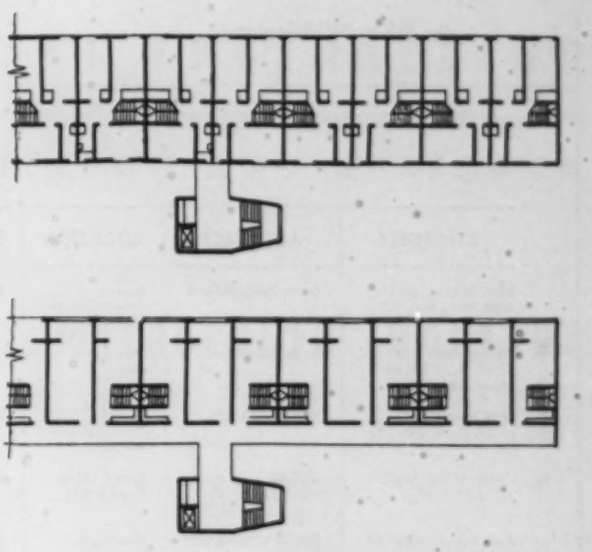
in 1933 and still being built, and more in the planning stage today. What might these limits safely be? Certainly we cannot favor deletion of all present provisions for a separate exit from the second floor of a duplex. This would be fine for the enthusiasts of the skip-floor corridor, but it has too often been suggested by people in haste to make certain profitable building alterations. The question suggests that present codes did not contemplate the small compact apartment whose interior stair is but a few feet from room doors on one level and but a few feet from a public hall door at another, with the plan so arranged that none of these distances lie through any living space other than, at most, an entrance or dining foyer. But how could present laws written long ago have contemplated a skip-floor corridor plan, first conceived, we believe, by Pingusson in France and by Tullgren in Milwaukee? Both were erected in 1933. Yes, it is time for a careful amendment of codes to permit a reasonable departure from the classic provisions directed to the conventional and generally large duplex (even triplex) apartments.

Prior to the "skip-floor corridor" plan came the balcony access (German) and side-corridor plans. Tending to balance the diseconomy of long corridors and much outside wall was the simplicity and regularity of structure, plan and mechanical system. So these plans prospered and are now regular practice for London's modern public housing. Rooms of like size and use being one above the other eased the sound reduction problem, particularly as to impact noises. No legal exit complications were involved. However, to retain cross ventilation by way of windows on the access balcony or side corridor meant to compromise privacy of any kitchens, baths, or minor rooms next to the balcony. This is where the skip-floor system came to the rescue, also enabling a deeper building with lower ratio of exterior wall, reduced corridor length etc. — but withal threatened by a relatively complicated plan structure.

The skip-floor corridor idea invited interlocking plans and sectional arrangements, overlapping duplex systems, etc., tested the ingenuity of the architect, confounded the plumber, and puzzled the acoustical engineer. This planning is



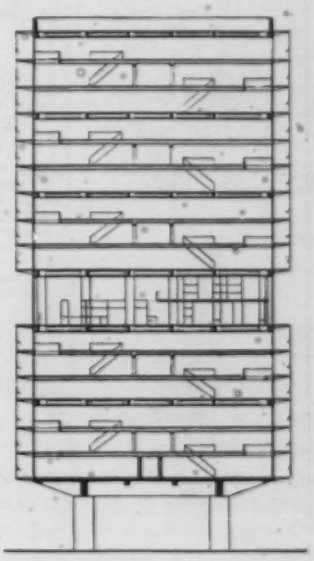
ELEVATION SYSTEM



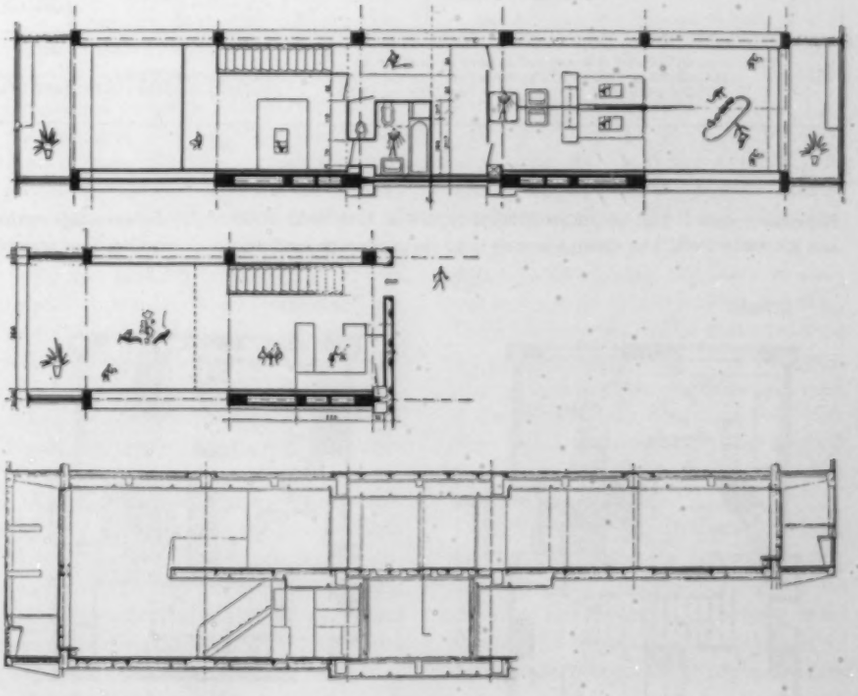
OTTO SILVA, PAUL WIENER & JOSÉ SERT's 8-story apartments nearing construction for the new "Motor City" near Rio de Janeiro. Through-ventilation duplex apartments, side corridor on alternate floors. SILVA has found a number of interesting elevation systems arising from the various skip-floor corridor plans studied

still in its infancy. Few of the architects using the idea have developed all of its advantages in a single system. Some, including Le Corbusier at Marseilles, have used it primarily, it seems, to secure a long thin building but without through ventilation. Le Corbusier's discarded plans showed through ventilation by cross duplexing. But his final plans gave up through ventilation except occasionally, and duplexed the apartments so as to orient each with but one exposure, either east or west. Also, Jeanneret largely forsook through ventilation at Puteaux in 1948.

Development of unusually interesting façade patterns has been a by-product of these plans. And this does not necessarily rely on the brise-soleil for dramatic effect. In systems employing corridors on every other floor, the corridors may be scheduled sectionally to occur in succession on two floors followed by two successive non-corridor floors. This gives the exterior a strong stratification rather than an unbroken series of horizontal layers. The Motor City (Brazil) studies show this well. Other interesting exterior patterns arising from the skip-floor corridor idea are illustrated by Silva-Wiener-Sert studies and by Jeanneret's studies of Puteaux in which he illustrates three basic possible rhythms depending on how the corridor is scheduled and the duplexes interlocked.



LE CORBUSIER's 20-story apartment building now in progress for Marseilles. Partly through ventilation and partly not. Corridors every third floor. All apartments are duplexed. There are 5 types in the building's schedule, but only one of these is "cross" duplexed for through ventilation. All the others are duplexed to a single exposure. Interior baths and kitchens. Master bedroom is on gallery above the living room and faces the brise-soleil and balcony system which occurs on east, west and south exposures. The plan is unusually deep



ANNOTATED BIBLIOGRAPHY OF "SKIP-FLOOR" PLANS

By Julian Whittlesey

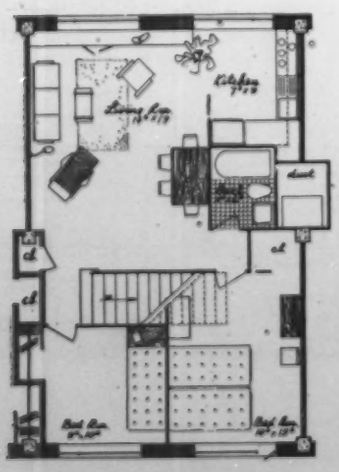
REFERENCE	ARCHITECT	LOCATION	STATUS	FLOORS	REMARKS
Ency. D'Arch., p. 356; Arch. Rev., Apr. '33	G. H. PINGUSSON	France, St. Tropez, Hotel L'Attitude 43	Built 1933	10 fls. firepr.	Side corridor. Through ventilation. Simple plan. Regular structural and mechanical systems. A first attempt. While not a true skip-floor corridor system, this interesting plan led to further developments.
da Rassegna di Arch. 1937, p. a120; Arch. Forum, Jan. '34	H. TULLGREN	Milwaukee Apts.	Built 1933	9 fls. firepr.	Through ventilation. All duplex. Corridor alternate floors. Regular structural and mechanical systems. Simple plan. First in U.S.A.
Arch. Record, Nov. '39, p. 35, Arch. Rev., Ap. '33	WELLS COATES	London, Palace Gate Kensington Apts.	Built 1939	8 fls. firepr.	Through ventilation. Duplex apartments. 1½-story living rooms. Side corridor each third floor. Excellent simple plan. Regular structural and mechanical systems.
L'Arch. D'Auj. Sept., '47, p. 46, 47	OSCAR NIEMEYER	Brazil, Ouro-Preto Hotel	Built c. 1943	3 fls. firepr.	Through ventilation, duplex apartments with 2-story living rooms and interlocking with 1 room suites. Central corridor alternate floors. Regular structural and mechanical systems. Simple plan.
Arch. Forum, May '43, p. 138–145	SERGE CHEMAYEFF GROUP	New York City	Study 1943	10 fls.	Similar to Wells Coates' Palace Gate apartments, described above.
L'Arch. D'Aui., Dec. '47, p. 44–47	P. JEANNERET	France Puteaux Apts.	Proposed 1948	14 fls. firepr.	Partly through ventilation, partly not. Many single exposure duplex apartments. Otherwise duplex through ventilation apartments, interlocking with one room suites. Central corridor alternate floors. Regular structural and mechanical systems. Simple plan.
L'Arch. D'Auj., Sept. '47, p. 113	OTTO SILVA PAUL WIENER & SERT	Brazil, "Motor City," near Rio de Janeiro, Apts.	Nearing construction 1949	8 fls. firepr.	Through ventilation. Duplex apts. Side corridor, alternate floors Simple plan, structural and mechanical systems.
Arch. Record, Feb. '49, p. 107–123	WM. H. BROWN ROBERT KENNEDY CARL KOCH VERNON DE MARS RALPH RAPSON	Cambridge Eastgate Apts for M.I.T.	In construction 1948–49	12 fls. firepr.	Mostly through ventilation. Central corridor every third floor. Through ventilation flats above and below corridor floor reached by private stair. Also side corridor and similar through ventilation flats above and below. Single exposure 2 and 3 room apts. at corridor floors.
Michael Reese Hospital, housing plan brochure Oct. '46	MICHAEL REESE HOSPITAL PLANNING STAFF AND REGINALD ISAACS	Chicago, for Michael Reese Hospital, Apt.	Final plans 1948–49	15 fls. firepr.	Combined with conventional cross plan. Mostly through ventilation. Side corridor every third floor, through flats above and below corridor floor reached by private stair. Single exposure 2½ rooms apartments at corridor floors. Exterior kitchens in duplexes. Interior kitchens in 2½'s.
Ency. D'Arch., p. 347; Le C. Oeuvres 38–46, p. 172–187; L'Arch. D'Auj., Sept. '47, p. 137	LE CORBUSIER	Marseilles	In construction 1949	18 fls. firepr.	Partly through ventilation, partly not. Central corridor every third floor. Interior kitchens and baths throughout. 5 types apts., all duplex but only 1 type is duplexed to get through ventilation. Other types are duplex but single exposure. Balconies and brise-soleil, east, west, and south. Very deep plan.
Prog. Arch., Feb. '47, p. 42–48	ILSA MEISSNER	New York City site	Student thesis 1947	7 and 15 fls.	Mostly through ventilation. Central corridor every third floor. Through ventilation flats above and below each corridor floor, all reached by public stairs. Single exposure apts. at corridor floors include the 5 room type which is a serious defect.
Arch. Record, Nov. '47, p. 86–88	HARVEY WILEY CORBETT & CHARLES H. SACKS	New York City	Study 1947	Multi-Story	Through ventilation duplex apartments. Alternate floor corridors. Simple plan and regular mechanical and structural systems. Efficiency analysis compares this plan to the 5-wing plan by Fellheimer, Wagner and Vollmer.

Other unpublished studies are known to have been made by

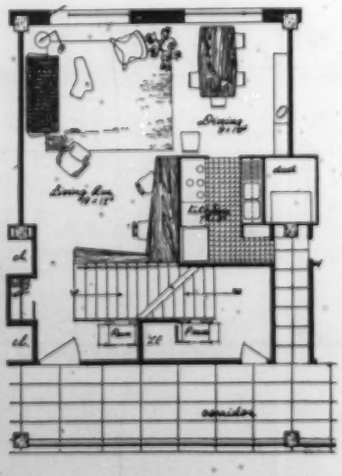
HARRISON & FOUILLHOUX	New York City	c. 1940	MAYER & WHITTLESEY	New York City	c. 1942
HUSON JACKSON	New York City	c. 1938	CHICAGO HOUSING AUTHORITY STAFF		c. 1947

Preliminary plans (1946) by MICHAEL REESE HOSPITAL PLANNING STAFF and REGINALD ISAACS for Chicago promise to go ahead. Through ventilation duplexes. Side corridor every third floor. Through flats above and below the corridor floor are reached by private stair. 15 stories are planned

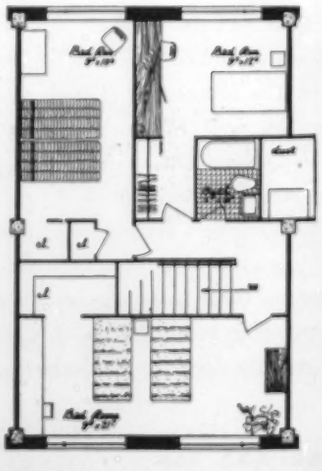
LOWER



MIDDLE



UPPER



RESEARCH IN THE CONSTRUCTION INDUSTRY

By C. F. Rassweiler *

THE PUBLIC has been fed so many imaginative and spectacular articles on what research is going to do about housing that too many people are expecting the solution of all our housing problems to arrive suddenly full-blown from some secret research laboratory. But we know too much about this building industry to expect all of our problems to be solved by hanging a house from a pole or designing a machine to lay a house the way a hen lays an egg.

Actually, research in the construction industry is faced with certain peculiar industry problems which must be recognized if results of practical value are to be secured. In the building industry there is no one or even any small group of commercial organizations which can fully control a new building all the way from the initial conception to the point where it is turned over in completed form ready to use. In the construction industry, we are still in somewhat the same situation as the automotive industry early in its history when the development and design of the motor, the brakes and the other component elements were largely in the hands of the parts manufacturers.

One of the problems of conducting research in the construction field is the difficulty of setting and defining clear-cut objectives, particularly regarding the materials which go into construction. People in Florida, Vermont, Seattle, and Los Angeles are willing to accept identical automobiles and refrigerators but there is no sound basis for asking them to accept the same houses. Also, the success of a building material depends not only upon its own cost but upon its cost of installation, and this will vary with building requirements and building practices from locality to locality. Research is also handicapped in the construction industry by the time necessary both to demonstrate the satisfactory performance of a new material and to persuade home builders to accept it.

It has become popular to talk about construction as a backward industry, but, in spite of the difficulties handicapping research activities, technical improvements in building practices of tremendous importance have been made steadily over a remarkably long period of building growth. Based on this past record, we are justified in predicting certain broad types of accomplishment for research in the future.

Perhaps we should first consider in what directions research might proceed to reduce building costs. We might start by thinking of what research might do to permit the utilization of cheaper raw materials for housing. We must recognize, however, that the construction industry already uses extremely low cost raw materials. It seems unlikely that we can expect research to find very much cheaper basic raw materials than those now in use. Therefore, research must reduce *the amount of material* needed for a house, or reduce *the man-hours* of labor required to convert the raw material into finished housing. One way is to make one material do the work which now requires two. For example, asbestos siding shingles accomplish the purpose which originally required both wood siding shingles and paint. Also, gypsum board replaces both lath and two coats of plaster.

Another way in which research will reduce costs is through the development of building materials which can be applied in *larger unit sizes*, thus reducing labor expense. The size of the individual pieces used in the construction of a house will steadily increase, and the number of

pieces required will, therefore, steadily decrease. The number of pieces to be erected can also be decreased by assembling the materials into prefabricated sections in a factory before shipping them. This would make it possible to expend in the factory an increasing percentage of the man-hours necessary to convert raw materials into finished housing. However, the extent to which this takes place will be affected less by research than by the outcome of the competition between factory labor and site labor for a bigger share of the work involved in housing.

In attempting to give the customer more value for the dollar, factory prefabrication has attracted a great deal of attention as a possible means of getting the greatest value for the customer out of the hours of labor necessary to convert raw materials into finished housing. There has been the feeling that machines can be used more effectively to increase labor productivity in the factories than at the construction site, and that planning and supervision can be applied there more effectively to increase the productivity of labor.

On the other hand, there are very definite advantages in converting raw materials into finished housing at the job site. For example, it is frequently cheaper to transport the materials in unfabricated form. Large units may re-

* Vice President for Research and Development, Johns-Manville Corporation.

quire extra strengthening and special design to withstand shipping, and their handling may require expensive equipment. Moreover, expending a considerable amount of the labor at the site offers flexibility in operation which may reduce cost by fitting the design to local conditions, utilizing local materials and local skills. The emphasis which research places upon the development of materials for prefabrication or for site erection will depend upon the relative aggressiveness of prefabricators and factory labor on one side and site erectors and site labor on the other in trying to give the customer the greatest value for his money by utilizing new ideas and materials.

Any consideration of possible technical improvements in construction must recognize that, in addition to research on building materials, there is need for research on the entirely separate field of design, assembly of materials, and methods of erection for small homes. The industry is poorly equipped to carry out research in this field, although many local builders have done worthwhile work on this problem. Perhaps the most significant research work in this field has been carried on by the Producers' Council with the Industry-Engineered House. The importance of experimental construction as a means of testing the results of consultation and design and the effectiveness of experimental construction in developing new ideas already have been demonstrated at the University of Illinois on erection studies centering around the Industry-Engineered House and by other research institutes with more general objectives.

Because there are no dominant commercial organizations in the building field to carry on research on actual house construction and to coordinate this work with the development of building materials, some other means must be found to achieve the correlation of research activity. The most important move in this direction is the start which has been made toward organizing the Building Research Advisory Board under the auspices of the National Academy of Sciences and its agency, the National Research Council. The formal objectives of this Board have been widely publicized. Putting these objectives in simple terms, the Board might be expected to do the following:

1. Determine and clearly state the most important needs of the construction field which research should attempt to satisfy.

2. Make a survey to see how much research is being directed toward the solution of these needs.

3. Where work is being directed toward objectives of minor value, attempt to have the work shifted to more worthwhile objectives.

4. Where there is duplication or competition, attempt to foster cooperation.

5. In fields where there is insufficient research activity, attempt to stimulate interest and persuade logical public or private interests to undertake needed work.

6. Give advice and aid in directing any government funds toward worthwhile objectives.

7. Attempt to secure utilization of research results.

It is important that the collection of the funds necessary for this work be pushed with all possible speed.

The real cost of a house is no longer the actual cost at the time of construction, but rather the sum of the monthly carrying charges plus maintenance and repairs. Anything that research can do toward reducing the cost of maintenance or repair actually is a contribution to reducing the cost of home ownership. This is a logical field for building material research.

When we think of the really major accomplishments of industrial research, we do not think only of what research has done directly toward cost reduction. Rather, we think of those new things which research has created to increase the comfort and the interest of living. We think of the new or improved things created to constantly provide the increased desire to consume, so necessary to balance our constantly increasing ability to produce.

If research is to live up to its potentialities, it must provide not only cheaper, but better housing, not particularly more durable housing, but housing that will give the owner greater joy of living — housing that will offer much more in the way of comfort and satisfaction. In this way, people who really have sufficient money to build good housing constantly will be discarding their old houses and building or acquiring new ones. Perhaps this may

sound like a wasteful procedure, but actually it is the economically sound and historically correct solution for the problem of low-cost housing. No one felt it necessary to solve this problem for the automobile industry by providing Government subsidy for the building of new cars for this market. The automobile industry solved it by putting into each successive model new features for owner satisfaction. In the automobile market, the sale of cars to the low-income groups is constantly subsidized by the people who have enough money to be constantly reaching for a greater transportation satisfaction.

It is difficult, if not impossible, to conceive what the improvement might be that would have as profound an effect upon increasing satisfaction in home ownership as, for example, the introduction of inside plumbing and toilets. This is no reason, however, why we should not recognize that developing such an improvement should be a major objective which research should constantly keep in mind. If we cannot conceive of its arriving from some specific development, then we must strive to create it by joint effort of material development, architectural design, and adjustment to local climatic and geographical situations.

The successful application of research to the problems of the construction industry calls for voluntary coordination and cooperation to an extent never before successfully achieved in the field of research under anything except the pressure of actual war. It is up to us to see that the mechanism and the means are provided for expanding voluntary cooperation to the point where it adequately covers the full needs of the industry.

WATER-REPELLENT PRESERVATIVES WORK ON WOOD

Toward effective control of shrinking, warping, swelling, decay and termites

Harlan H. Edwards, Consulting Engineer, Seattle, Washington

A COMMON complaint of the housewife might go something like this —

"I'm getting tired of having windows and doors that swell and stick so tightly that every time we have a rainy spell I can't operate them. Can't you do something about them?"

Of course, the reason that wood windows and doors cause trouble in wet weather is that like all other kinds of wood, they swell and shrink with moisture change, in greater or less degree depending upon their cell structure. *Rapid* gain or loss of moisture produces greater expansion or shrinkage in the surface portion of a board than within, thereby setting up stresses that cause warping, cupping, splitting or surface checking. Also, *too great* gain in moisture content causes raising of the grain which destroys the smoothness and surface character of the wood, while the *continued presence* of moisture in wood sets up conditions ideal for the development of harmful fungi or rot, or for termite infestation.

Further technical discussion of water repellents, preservatives and their combinations will appear next month in an article by Dr. F. L. Browne, Chemist, Forest Products Laboratory, Madison, Wisconsin.

Other Sources and Effects of Moisture

It is a common occurrence in new buildings to have changes in fit of doors and windows take place during finishing operations or after occupancy. These are due to the changes in moisture content which always follow the drying of brick, plaster or tile work, and the starting of heating systems. Doors warp and stick, and windows change their operating characteristics because unpainted edges and poorly painted surfaces permit moisture to enter the wood.

Outside finish and siding also come in for their share of damage due to dimensional change. Warped trim, cupped or split siding and stained, blistered or peeled paint are too common, all due to dampness, whether originally present in the wood, acquired periodically from rain, or resulting from the condensation of water vapor upon the hidden surfaces inside the outer walls of the building.

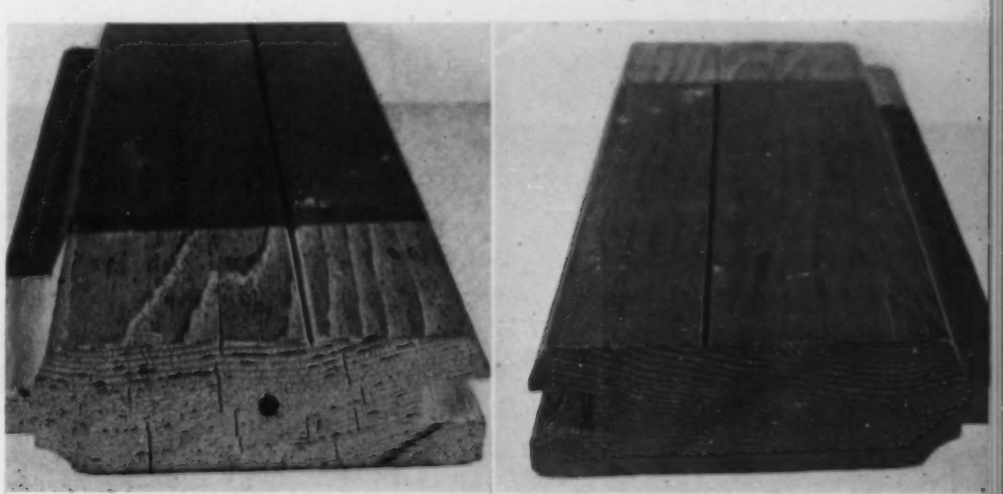
Air conditioning, humidifying, weatherstripping and furnace heating have greatly changed conditions within buildings. The moisture added by unvented heaters, by humidifying equipment, by cooking and by people is not removed, as in earlier years, by air leakage around doors and windows. Instead, in the event no vapor barrier is used, the moisture passes unnoticed through the walls. If the weather is cool, the vapor condenses on the cold studs, on the back of sheathing or on the underside of roofing (where ventilation is inadequate) and eventually causes rot and mold, or trouble with blistered paint.

Toxic, Water-Repellent Treatment

By preventing the ready absorption of moisture by the wood, these difficulties may be controlled and to a large extent eliminated. This is accomplished by dipping the dry wood after fabrication into a colorless solution which is both toxic to fungi and termites and water-repellent in its action on wood. The duration of immersion averages three minutes depending upon the kind, size and character of the wood members being treated and upon the depth of penetration wanted.*

This solution, obtainable commercially as *Woodlife* (Protection Products Co., Kalamazoo, Mich.), *Woodtox* (Monsanto Chemical Co.), *Permatox WR* (Chapman Chemical Co., Memphis, Tenn.) and other brands, is a comparatively little-known pre-war material that did an outstanding job during the war in

* *Ed.—One manufacturer recommends that lumber to be used in contact with the soil or other severe conditions of exposure (sills, joists, etc.) be soaked in the solution until substantially all of the sapwood is penetrated whenever possible. This requires from one to six hours depending on the character and dimensions of the lumber.*



Portion of this wood specimen dipped in water-repellent preservative (indicated by dark color) did not check, crack when subjected to rapid drying conditions as did the untreated part. Stain was added to the treating solution for observation purposes

making possible the use of lumber and plywood to replace steel, and often doing a better job under the most severe conditions.

Chemically known as a solution of the preservative pentachlorophenol[1] with certain water-repellent resins in a penetrating solvent, this material has been thoroughly tested and finally approved for standard treatment of wood finish by national research and trade organizations. It is being specified as a "must" by architects and is voluntarily used by contractors throughout the nation, as they learn of its characteristics and performance.

What the Treatment Does

Complete immersion is necessary, rather than merely surface painting with the toxic water-repellent solution, because the liquid must thoroughly penetrate and saturate the exterior portions of the wood. Evaporation of the solvent leaves an elastic, permanent film which, lining the tiny wall cells, is resistant to the passage of moisture and gives the wood units a moisture-controlling and rot-preventing armor. As the result of this moisture stabilization, dimensional change is reduced and the natural association of wood and water is materially lessened. The toxic water-repellent film which lines the cell walls within the wood acts as a barrier, retarding the migration of water vapor through the wood and thereby decreasing the warping or splitting of siding and the blistering or staining of paint.

The addition of approximately $10 per thousand board feet to the cost of the finish and millwork is small as insurance against this. It is entirely offset too by the saving in cost of replacement that might otherwise be required, to say nothing of the increased values to the user in not having to experience these vexing difficulties.

In addition to correcting the housewife's problem, the results of this dip treatment are of great value to finish painting operations. While the coating is definitely not a seal coat, it acts as a partial prime, preventing the excessive "striking in" of the paint and providing a base coating that bonds well with paint materials. It protects the paint bond from the destructive effects of moisture beneath and reduces the deep contrasts in appearance produced between spring and summer wood, when oil stains are used. It should not, however, be used when a bleaching process is to be employed as a part of the paint finish.

Protection Against Decay

The toxic character of the dip liquid is exceptionally valuable as insurance against damage by growth of fungus and the development of rot in damp and poorly ventilated places. The loss occasioned by fungus growth in a fine home seen by the author in California was sufficient to have paid many times over for complete treatment of all lumber in the structure.

Starting under the building in a poorly ventilated area near a concrete porch, the decay spread under the fine floor of the living room. It continued up the wall sheathing and studs, which had not been protected by a vapor barrier, and spread into the second story timbers and flooring like the branches and foliage of a tree. When it was discovered, the supporting wall timbers had become so weakened that failure was imminent.

Of course, one will say, this could have been partly prevented had the house been properly ventilated through foundation openings. However, in these days of fuel shortages and high costs, an uninformed owner or tenant may cover these openings to keep out the cold drafts instead of insulating his floor, and it does not take long for rot to develop under these conditions.

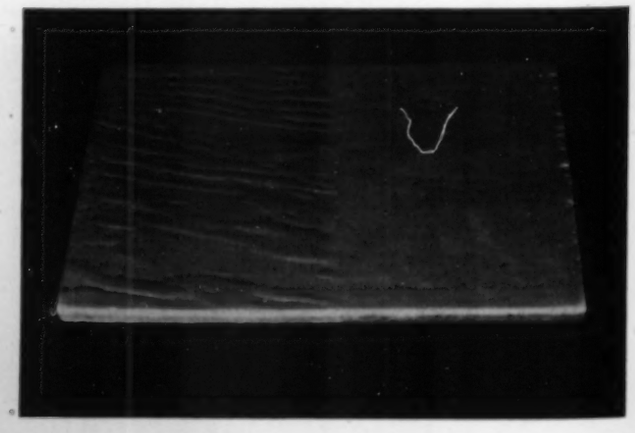
Condensation from humid air on the lower side of roofing and roof sheathing and in walls of a school in Washington State caused rot which destroyed the usefulness of the timber, and created a dangerous condition — a person walking on the roof might break through under his own weight. Large areas of sheathing could be removed with the fingers alone.

Another job suffered similar damage, wherein the upper two inches of a 3 in. plank roof was rotted before the situation was discovered, leaving a scant one inch of reasonably good wood to carry the roofing and live load over a span of 10 to 12 ft. Replacement costs in each case far exceeded what it would have cost to have dipped all the wood in the building.

Colors Added to the Solution

Cedar or similar wood shingles are naturally long lived, and generally are applied to a building without treatment. Since many people want different colors on the roof, and since occasional oiling has been found to add to their life, many shingle jobs are coated with an oil stain after laying. While this is perhaps better than no oiling at all, the coating brushed or sprayed on merely covers the surface and does not seal the ends or protect the shingle where one laps over the

The right half of this board was dipped in water-repellent preservative solution. It was then painted and later exposed to high humidity. Note the raised grain on the untreated side



[1] *Ed.—According to the National Door Manufacturers Ass'n, the fungicides most widely used in water-repellent preservatives are the chlorinated phenols, phenylmercury oleate and copper napthenate.*

other — the place where moisture remains and decay starts.

Guarding against this, shingles on better work sometimes are pre-dipped in linseed oil and kerosene (and often much cheaper stains) and bundled for shipment. However, the water-repellent preservative solution with permanent colors added have opened up a new field of quality treatment. Shingles coated with this material usually hold their color and new character longer, since the soot and dirt wash off easily with each rain. Through the high penetrating qualities of the solution, shingles may under certain conditions be saturated satisfactorily by just loosening the bundle before dipping. This treatment lengthens the life of the roof not only by the greater permanence and effectiveness of the water-repellent treatment, but also by the added feature of toxicity which prevents fungus growths that are harmful to the roof.

As an experiment to show a "doubting Thomas" the value of even a minimum job of painting the preservative solution on a moss-covered shingle roof, the shingles were given a saturation paint coat. The moss soon withered, and after a few weeks the roof was clear. Such a low-cost application, however, can best be applied by spray using a coarse nozzle so that a saturation coat of the liquid can be driven around and under the shingles where brush application cannot reach.

During the war the addition of permanent colors to the water-repellent preservative solution extended its use to that as a preservative stain on finish lumber and millwork. A quick drying dip paint carrying the same preservative characteristics and at the same time having high hiding power was also developed in Seattle and was used very successfully on materials prefabricated for housing. Both the stain and the paint were applied to the material in the plant. Just a touch-up job was required after final erection. It combined dimensional control with preservative treatment and a paint priming job on all surfaces of the wood, at a cost comparing very favorably with the cost of priming alone. It had the added value of reducing or preventing premature checking and cracking of the lumber, a feature particularly valuable when unseasoned or wet lumber had to be used.

Protecting Wood During Storage, Shipment

The ability of the preservative dip treatment, even when immersion is as little as five seconds, to control checking and cracking of finish was strikingly given by the E. A. Nord Co., millwork manufacturers of Everett, Washington, who wrote in response to my inquiry:

"During the month of July, 1946, we ran a large quantity of 4 by 6 in. fir into special detailed window sill that was to be used for all of the sash in our new factory building. Since an estimated 60 day period would elapse before the building would be ready for framing, the 4 by 6 in. sill was treated by being submerged in a toxic dip solution for approximately five seconds. This material was then hauled to the new site on Puget Sound where it was stacked in the open without any protection from the weather.

"The framing operation for sash in the factory began the latter part of September. At this time a close inspection of the 4 by 6 in. sill members revealed that only minute checks were present in the ends while no checking was found on any face of the members. Other material, not toxic dipped, stored near by under similar conditions had considerable end and surface checking showing.

"This experience has proved to us that the toxic dip treatment to lumber will greatly retard checking."

Somewhat similar experiences are also reported in connection with boxcar shipment of rough, green lumber from humid seaport and forest areas into more arid districts. When the cars are opened in the dry air, the untreated lumber soon begins to crack and snap as the quick evaporation of the surface moisture takes place. This results in loss through twisted, split and checked lumber, an occurrence which is noticeably absent with similar shipments of treated lumber.

Loss sometimes occurs through absorption of water in sea shipment. Dipping can greatly reduce such loss. This was shown on shipments of kiln dried finish for Alaskan construction under the author's direction. On one job, 2 by 6 in. T&G sheathing to be used for interior finish had been kiln dried and wrapped in heavy kraft paper before loading on ship. When it arrived on the job it was so badly warped that it could not be used. A second shipment was made, and suffered a similar fate. Then a third shipment was dipped for five minutes in the water-repellent preservative solution. It got through all right,

Lack of crawl space ventilation often sets up a humid condition, making untreated wood subject to decay. Adequate ventilation and, frequently, ground treatment are advisable for crawl space areas; however, a preservative used on the wood provides additional protection in case the ventilation openings are ever closed up by uninformed tenants or owners

and the experience led to the adoption of the treatment for all finish and millwork sent to that area.

Another advantage was evident from experience with finish which had been previously sent primed and back primed with paint, wrapped several pieces in a bundle. The finish sometimes arrived at the job welded or stuck tightly together by the paint, because it had not dried thoroughly before wrapping. Dipped material, however, was stacked and bundled after a few moments of draining and did not stick together at all.

Prefabricated houses which fit perfectly in the shop do not go together well in the field, if they become wet in transit or are placed in an atmosphere of different humidity. A change of dimension costs money to correct, detracts from the quality of the job, and thereby delays acceptance of prefabrication by the public. Experiences of this kind are causing mills doing prefabrication work to use the water-repellent toxic dip treatment or the water repellent treatment alone.

Assuring Proper Treatment

The architect, contractor or owner should take precautions to assure proper treatment. Some unscrupulous operators have substituted a cheaper thinned sealer, with poor results. Others have used extra thinner, which can be easily detected by checking the specific gravity of the solution. Others have added kerosene, which prevents the dip liquid from drying and also causes trouble in painting.

The best method of control has been to place the responsibility on the manufacturer or distributor of the water-repellent preservative — requiring supervision and certification of correct treatment by stamps on the material similar to grade marks on lumber. This was done very successfully during the war on material for Alaskan coastal construction under the writer's direction, by arrangement with the companies concerned.

Control can be set up in the specifications for the water-repellent preservative dip. The specification should cover the following items and conditions:

Preservative Treatment of Wood

All sleepers and subfloor, all wood in contact with masonry, all interior and exterior trim, screens, sash, doors, flooring, siding, interior woodwork and all other kiln dried material, except that specifically eliminated, shall be treated by immersing for a minimum period of three minutes in a water-repellent preservative solution which conforms to the requirements of the following paragraphs. Before stacking, the wood shall be kept on edge until completely drained and shall be dry enough to paint or putty in 48 hours after dipping, when all surfaces are exposed to drying. The treated wood shall show no slow drying, softening, peeling, discoloration or other defects of the paint coatings due to the solution used.

The solution shall be of the oil-carrier, penetrating type containing not less than 5 per cent by weight of chlorophenols. The ready to use solution shall show a flash point of not less than 100° F. (Tag. closed cup method) and it shall meet the toxicity requirements of the Western Pine Association as determined by their standard toxicity test method.

The solution shall show substantially no sludge formation in the shipping drums nor in the treating tank at 40° F. When tested in the laboratory by means of the National Door Manufacturers Ass'n. test method, it shall show an effectiveness in reducing swelling of treated wood of 40 per cent or above, as compared with the swelling of untreated wood submerged in water at 80° F. for 8 hours.

Identification

All sizeable items treated as described shall be individually stamped on one end or on the unfinished side with the preservative manufacturer's certifications of quality. All small items that are bundled shall receive the stamp on at least one piece in the bundle, and all plywood shall bear the stamp on each sheet.

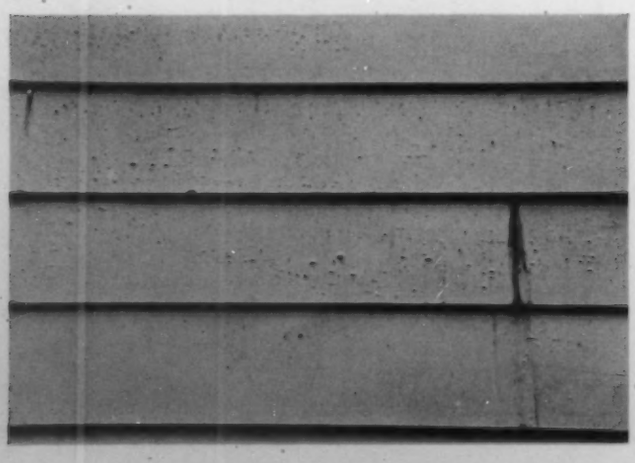
Inspection and Certification

Where the size and importance of the job warrant, clauses may be incorporated to the effect that the manufacturer of the water-repellent preservative solution or his distributor or agent shall:

1. Maintain a periodic inspection service at the mills, checking the solutions being used at each plant on each individual order, testing the same for consistency and certification.
2. Furnish suitable stamps and the proper ink for identification of the treated materials and
3. Shall provide certification that the materials furnished and applied meet the above requirements.

Upon receipt of the purchase order for materials requiring the above certification, the vendor shall immediately notify the agent of the manufacturer whose solution is to be used concerning the award so that proper inspection and certification may be provided.

Water-filled blisters on this siding are evidence of the passage of moisture through untreated wood. The dark streak resulted from condensation on asphalted felt located back of the wood



ATTIC CONDENSATION—CAUSES AND PREVENTIVES

Results of field and laboratory investigations by Forest Products Laboratory

Attic condensation troubles, more common in recent years because of the combination of increased insulation, tighter construction and higher humidities, usually occur because preventive measures are inadequate. If vapor passes from the heated part of the house into the attic in sufficient quantities — and is not removed — and the attic temperature drops low enough, the vapor will condense on the cold surfaces.

Two means of combatting condensation are ventilation through attic louvers and application of a vapor barrier. To get reliable data on the efficiency of ventilation openings as commonly installed in well-insulated houses and to determine the effects of different amounts of ventilation and of a vapor barrier on condensation, the Forest Products Laboratory, in cooperation with the Housing and Home Finance Agency, investigated attic conditions in three occupied houses in Madison, Wis., and conducted controlled experiments.

Conditions in Occupied Houses

The attic conditions were investigated from mid-January through February of 1947 to establish the range of temperatures and relative humidities that prevailed. Moisture contents of rafters and roof boards were checked periodically to determine where condensed moisture tended to collect in the greatest amounts.

The first house, designated as A, was a 1½-story frame structure having a small louver with 80 sq. in. of opening, covered with screen, in each gable end to provide through ventilation.

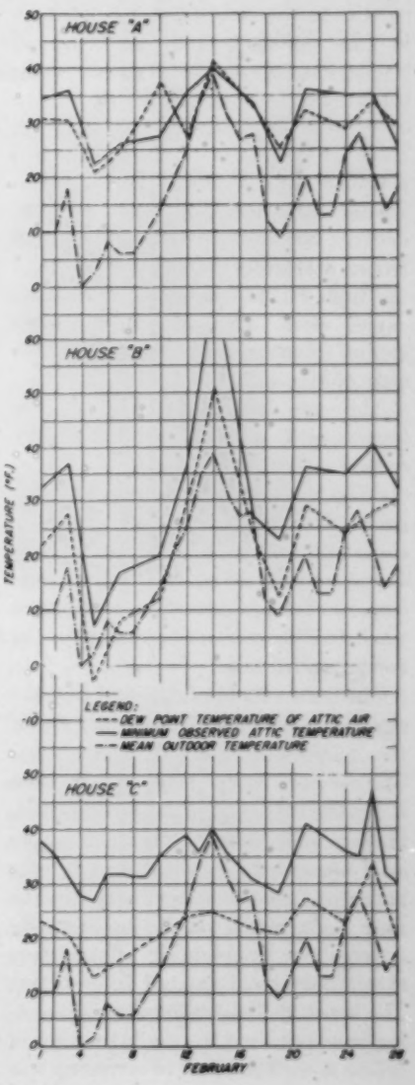
House B was a 1-story frame house with a vapor barrier used between the ceiling joists and lath. The two louvers, covered with 16-mesh screen, each had a 285 sq. in. opening.

House C was a 2-story frame building with the gable louvers each having a 55 sq. in. opening; in addition, ¾ in. spacing between roof boards provided about 37 sq. in. of opening at each gable end.

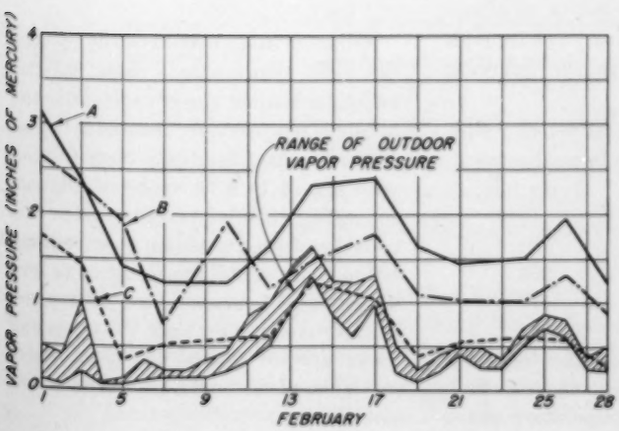
The ceilings of all houses consisted of gypsum plaster on rock lath and were painted with flat wall paint. Insulation was placed between the ceiling joists in all houses, being level full in Houses A and C and 5 in. deep in House B.

Results of Tests

The test data obtained for each house were used to plot the curves shown in Fig. 1. The curves for House A reveal the small margin of safety between the dew point and the minimum temperature of the attic air and also that the dew point exceeded the minimum tem-



The graphs on this page plot data taken when attic conditions were investigated in three Madison, Wis. houses. Fig. 1 (right) indicates that attic condensation was often possible in house A. House B, using a vapor barrier, and House C, with low humidity in the living area, remained out of danger. Fig. 2 (below) — migration of water vapor through walls and into attics is caused by difference between the vapor pressures of inside and outside air. This shows that House A was most susceptible to condensation troubles



Summary of Laboratory Attic Ventilation Tests

Temperature (°F)			Indoor Relative Humidity	Attic Air Changes per hr.			Condensation observed
Indoor	Attic	Outdoor	(%)	(%)	Insulation	Vapor barrier	
80	45	+0	50	None	None	None	Frost
80	37.5	0	50	95	"	"	None
80	39.5	0	40	None	"	"	Frost
80	37	0	40	75	"	"	None
80	40	−2	35	60	"	"	Frost decreasing
80	39	0	30	None	"	"	Frost
70	15	0	30	None	4 in. mineral wool	"	Slight frost
70	13	−2	30	93	"	"	Vent. not adequate to prevent frost
70	12	−2	30	140	"	"	Frost decreased
70	15	0	32	None	"	Asphalt coated paper	No frost
70	15	0	40	"	"	"	Slight frost
70	13	0	40	133	"	"	Frost disappeared

perature several times. There was a greater differential in vapor pressure between occupied quarters and attic of House A than for the others because of the high relative humidity of the occupied areas. This, of course, caused greater migration of moisture to the attic of House A.

The ventilation afforded by the louvers was well below that usually recommended, which is ½ sq. in. of opening per sq. ft. of ceiling area directly below, or 1 to 288. The 80 sq. in. afforded by each louver was reduced by 16-mesh wire to 54 sq. in. effective opening. The ratio of louver to ceiling area was 1 to 769, or about three-eighths the recommended ratio.

The curves for House B show that the dew point remained consistently below the minimum observed temperature. The louvers were kept closed from February 12 to the end of the test period. Since condensation conditions were safely avoided at all times, it was apparent that the vapor barrier in the attic floor made ventilation virtually unnecessary by blocking off moisture that would have entered from below. The house had louver openings amounting to about 1 sq. in. to 341 sq. in. of ceiling when the effect of screening was considered, which is fairly close to the recommended minimum.

In House C, the dew point also was well below the lowest attic temperature. In this house, however, the dew point was kept down because the relative humidity in the living quarters remained low. The louver openings were smaller than recommended, even when the openings between roof boards at the gable ends were included, the total making a ratio of 1 to 434.

Effect of Screen on Air Flow

As usually installed in attic gables or eaves, louvers are screened with 16-mesh wire cloth to keep out birds, insects and rodents. The effect of screen on the amount of air that flows through ventilators is shown in the following tabulation:

Air Velocity without Screen, ft. per min.	Air velocity with 16-mesh screen, ft. per min.
114	36
258	156
300	208
580	419
885	668

Calculations based on the test data show that, for low air velocities such as those induced by temperature alone, a 16-mesh screen may block off practically all air movement.

Laboratory Tests

The attic studies in occupied houses, while revealing valuable data on the relation of condensation to temperature and humidity conditions, afforded no opportunity to vary such factors as construction details, temperatures and relative humidities. To get a clearer picture of the effect of these variables, a test unit was erected at the Forest Products Laboratory.

In tests with this unit, frost was found to form first upon the roof sheathing in the overhang of the eaves and gradually to spread upwards a foot or more. Shortly after forming here, scattered frost spots gathered on protruding nails near the middle height of the roof. It also collected between the roofing and roof boards. The amount varied from light crystals to comparatively heavy deposits. Thermocouple readings showed that attic temperatures were lowest as a rule in the overhanging eave and materially higher at the middle and top of the roof.

The dew point temperature also was lower, for the most part, in the overhanging eave than in the attic proper. The fact that frost will appear in a tight attic space in spite of reasonably good protection against vapor transmission indicates the need for attic ventilation even where vapor barriers are used. The considerable lowering of attic temperatures caused when insulation was placed in the ceiling panel did not increase the formation of frost materially. The amount of ventilation necessary, however, to remove frost had to be greatly increased. This was because lower attic temperatures necessitated removal of much more air to get rid of the vapor.

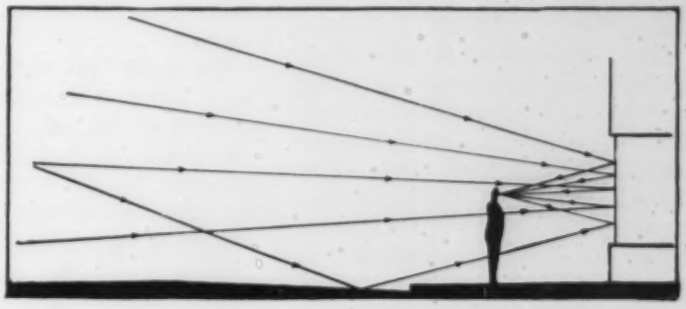
Although insulation markedly reduced the attic temperature, there still remained a distinct gap between attic and outdoor temperature, averaging about 15° F. This fact has distinct implications with regard to attic space ventilation, suggesting that temperature differences could be utilized to obtain positive circulation. With ventilators designed to take advantage of temperature differences, cold air could enter near the eaves and move upward toward the peak, where the warmed air could be vented to the outside.

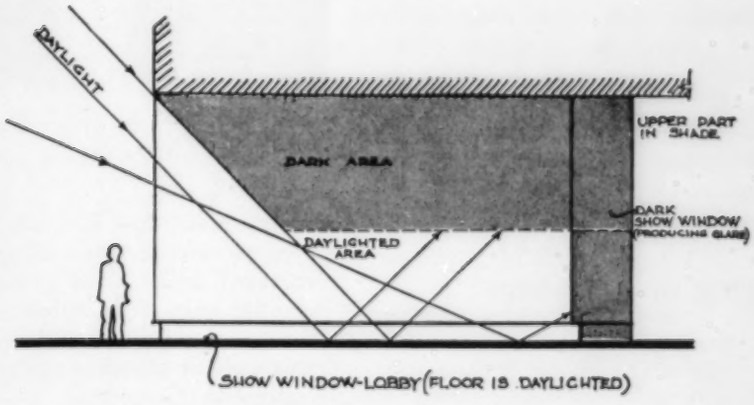
SHOW WINDOW DESIGNS TO PREVENT GLARE

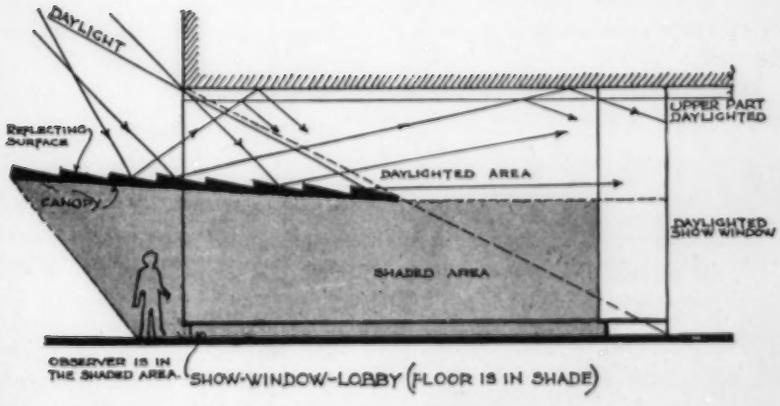
By Dr. Louis Parnes, A.I.A

Note: text and drawings are from Dr. Parnes' new book, *Planning Stores that Pay*, published by ARCHITECTURAL RECORD

Diagram at right shows how objects across the street or anywhere in front of a show window are reflected by flat glass. When brightness of reflections is greater than that inside window, glare results







Top: bad daylighting conditions found in many arcades, lobbies. Upper shaded area causes very dark show window interiors. Reflected sunlight in the lower area hits the show windows, producing glare. Bottom: corrected daylighting conditions. Through use of an intermediate canopy, the shaded and daylighted areas are reversed. Two remedies result—(1) all outside spaces under the canopy are darkened, the arcade floor is shaded and reflected sunlight from opposite buildings is shut off; (2) the top of the canopy receives and concentrates the direct and indirect rays and reflects them deep into the interior of the show windows

It is a well-known physical fact that a glass pane reflects in front of a dark background, but not in front of a sufficiently bright one. When the interior of a show window receives insufficient daylight, or is inadequately lit at night, the brighter objects and building fronts across the street are reflected in the show window pane. On the other hand, when the displayed merchandise is brighter than the reflected image of the opposite street front, it is easily seen.

Two methods can be used for the removal of glare:

1. Increasing the brightness of the interior of the show window and of the merchandise displayed.

2. Reducing or deflecting the brightness from external areas and objects being reflected in the window panes.

These two remedies can be only partially applied to the traditional show window system on open streets, but they may be successfully used for windows built according to new functional principles.

The brightness of an object is its general illumination times its reflective ratio, a product which may be magnified by increasing the intensity of the source of light. But the reflective ratio in a window can be increased only slightly through the choice of brighter objects or the use of bright backgrounds. Such measures will help to improve brightness, but when glare is extreme the merchandise displayed must be given an additional supply of brightness. The average show window lighting installation, however, is insufficient for counteracting glare by additional wattage.

Trials with supplementary electric

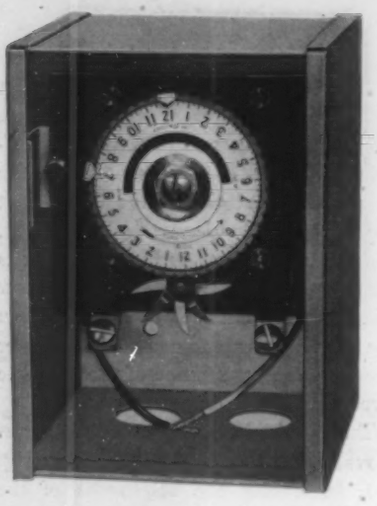
(*Continued on page 141*)

PRODUCTS for Better Building

TIME SWITCH

Electrical circuits of a wide variety can be provided with automatic on-off control through the use of the new *Tork-master* time switch. It has been especially designed to control window lights, signs, oil burners, stokers, intermittent pumping mechanisms, etc.

The time switch can be adjusted in 15 minute steps without special tools.



Time switch can be adjusted in steps of 15 minutes for automatic on-off control

Simple design, heavy-duty construction, a precision motor and improved gearing are said to assure prompt performance without regular attention.

The aluminum case is 3¾ by 4 by 5¼ in. and has a special attachment for padlocking. The synchronous, self-starting unit is said to handle up to 30 amperes on a single pole, and operates on 110–125 v., 60 cycle a-c. Tork Clock Co., 1 Grove St., Mount Vernon, N. Y.

AWNING TYPE WINDOW

Window lights of a new awning type window can be adjusted for ventilation by a patented crank mechanism which lowers each section from the top as it opens outward. Besides providing controlled ventilation, this arrangement is said to permit easy cleaning of even the top light from the inside of the building.

The crank-operated window lights can be opened from positions of a fraction of an inch to a full 85°. The crank mechanism locks the window in any desired position.

The *Super-Vent* window is made of wood sash and frame, completely assembled at the mill. Vertical bronze channels are used in the jamb for smooth operation. Individual adjustment plates are said to assure tight closing. Bronze weather stripping is used at the top and bottom of each sash. Super-Vent Co., 905 W. North Ave., Chicago 14, Ill.

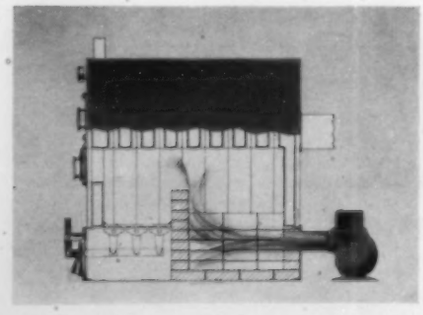
ALUMINUM ARCHITECTURAL SHAPES

Standard architectural shapes in extruded aluminum are now being offered by the Reynolds Metals Co. Shapes now available include thresholds; window sills, jambs, mouldings and stools; handrails with balusters and finishing shapes; base mouldings; copings; facia and gravel stops. Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

BOILER WITH PROVISION FOR EMERGENCY HEATING

An automatically fired boiler, recently introduced, incorporates a special grate for an emergency coal or wood fire in case of power failure. The emergency grates are located at the front end of the boiler, and the combustion chamber for the oil burner, gas burner or stoker is at the back.

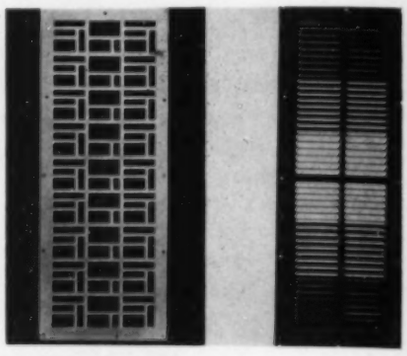
During normal operation, the grates are covered with insulation board in order to prevent air leakage. Should the power fail, the insulation can be quickly removed and a fire started before the system has cooled appreciably, according to the manufacturer. The grates are said to be of sufficient size to maintain comfortable conditions during emergency operation. The arrangement of the grate equipment is such that normal burner operation can be resumed immediately after power is restored. H. B. Smith Co., Inc., Westfield, Mass.



Special grate in automatic boiler permits emergency firing in case of power failure

AIR CONDITIONING GRILLES

In order to provide decorative quality and good operating performance in the same air-conditioning outlet, the Hendrick Mfg. Co. has developed a deflecting vane grille which is said to remain effectively concealed when an associated ornamental grille is placed in front. The deflecting vanes of the *Bulator* are constructed so that the air flow can be directed right or left, up or down, or in a combination of directions.



Vanes (right) for air conditioning outlet are concealed by ornamental grille (left)

The Bulators are available in a wide variety of design motifs. They can be supplied in a wide range of dimensions, bar sizes and perforations, in aluminum, bronze, copper, Monel, regular and stainless steel. Hendrick Mfg. Co., Carbondale, Pa.

TABLE TOP REFRIGERATOR

Glasco, a table top refrigerator with 5 cu. ft. net capacity, was displayed for the first time at an International Home Furnishings Market in Chicago last month.

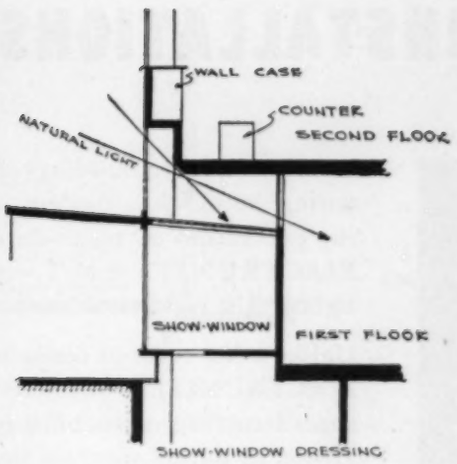
Reported to be "ideal for small homes and modern kitchens in which work space and shelf area is at a premium," the unit is 27 in. wide by 24½ in. deep and stands 34½ in. high. Legs or a standard 1½ in. top bring the height to the standard kitchen appliance measurement of 36 in.

Of welded steel construction, bonderized, and with two coats of high temperature baked enamel, the cabinet also features fiber glass insulation and adjustable gliders at the base for easy leveling.

(*Continued on page 172*)

SHOW WINDOW DESIGNS TO PREVENT GLARE

(*Continued from page 137; continued on page 143*)

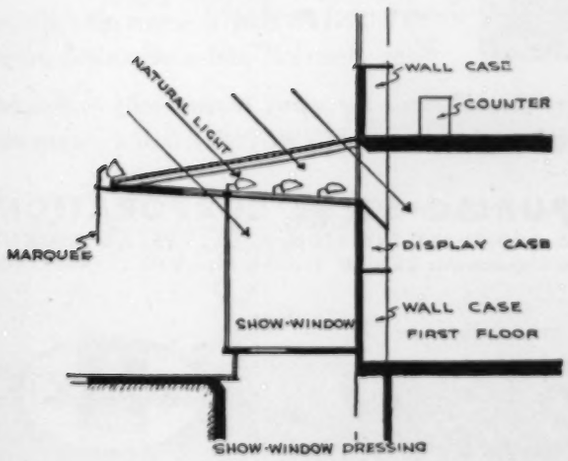


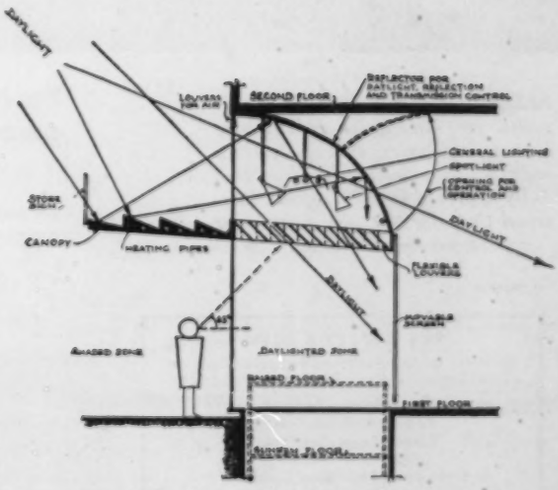
Section through a show window with a canopy and transom windows. The size of the latter is increased by "breaking" the second floor sills, allowing greater access of natural light into the show window

lighting have rarely brought about the complete elimination of glare. The necessary electrical costs, plus the cost of removing the resulting high intensities of heat, cannot be squared economically with the advertising value of the show window. From the point of view of economy, therefore, the complete elimination of objectionable daytime glare in show windows by electric lighting alone is still out of the question; though at night, when there are not too many conflicting auto lights, signs, street lamps, or similar sources of reflections, something can be done.

For this reason, special structural measures, transoms and skylights, are needed to admit additional daylight into the interior of show windows and thus cheaply reduce daytime glare. (See drawings this page.)

The second method of counteracting objectionable glare is to shut off or deflect the strong brightness of the reflected objects and surfaces from the glass pane. Shutting off requires structural measures such as canopies (pages 137, 141); deflection requires optical measures as are used with invisible glass panes (page 143).





Left: one of the best ways to stop glare is to extend part of the show window out from the building or to project it completely. Skylights over such windows flood the entire window space evenly with daylight, so that internal and external brightness contrast is equalized and glare eliminated. Right: this show window, with saw-tooth, reflecting canopy and transom windows, has flexible ceiling louvers and a reflector provided for additional daylight control. Dr. Louis Parnes, architect

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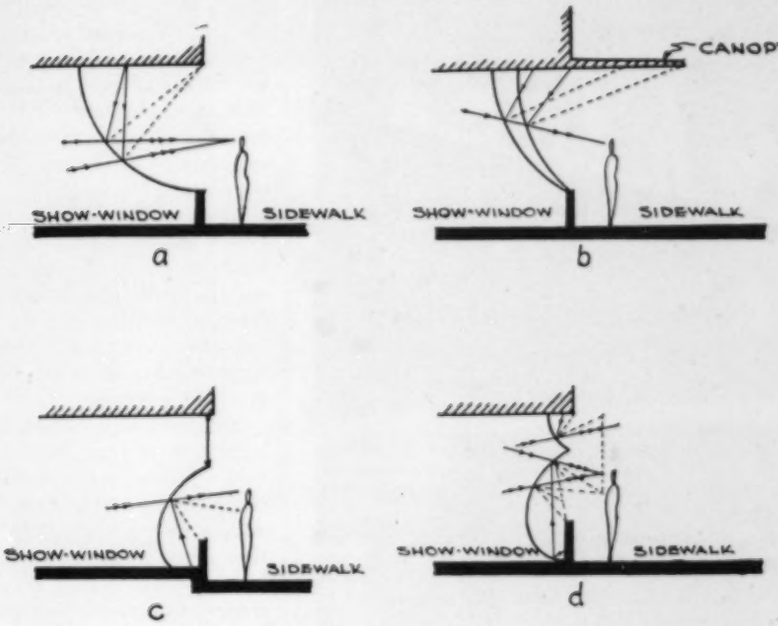
Republic REPUBLIC STEEL
ELECTRUNITE E.M.T.

LIGHTWEIGHT THREADLESS RIGID STEEL RACEWAY

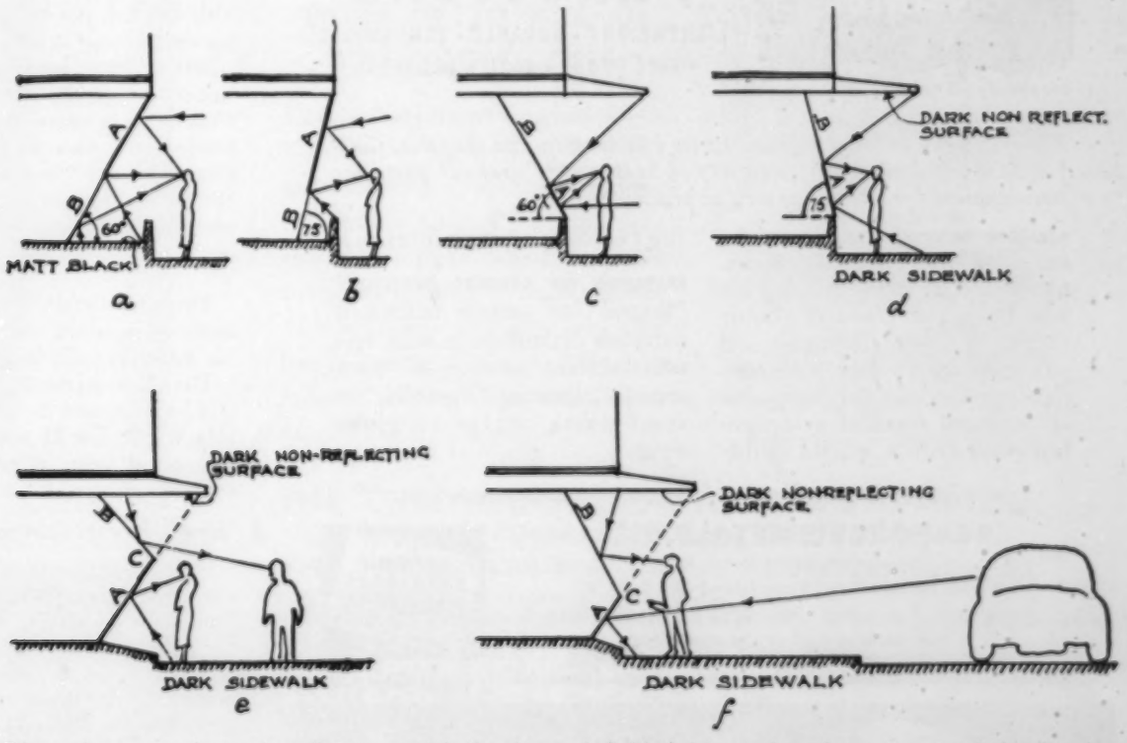
SHOW WINDOW DESIGNS TO PREVENT GLARE



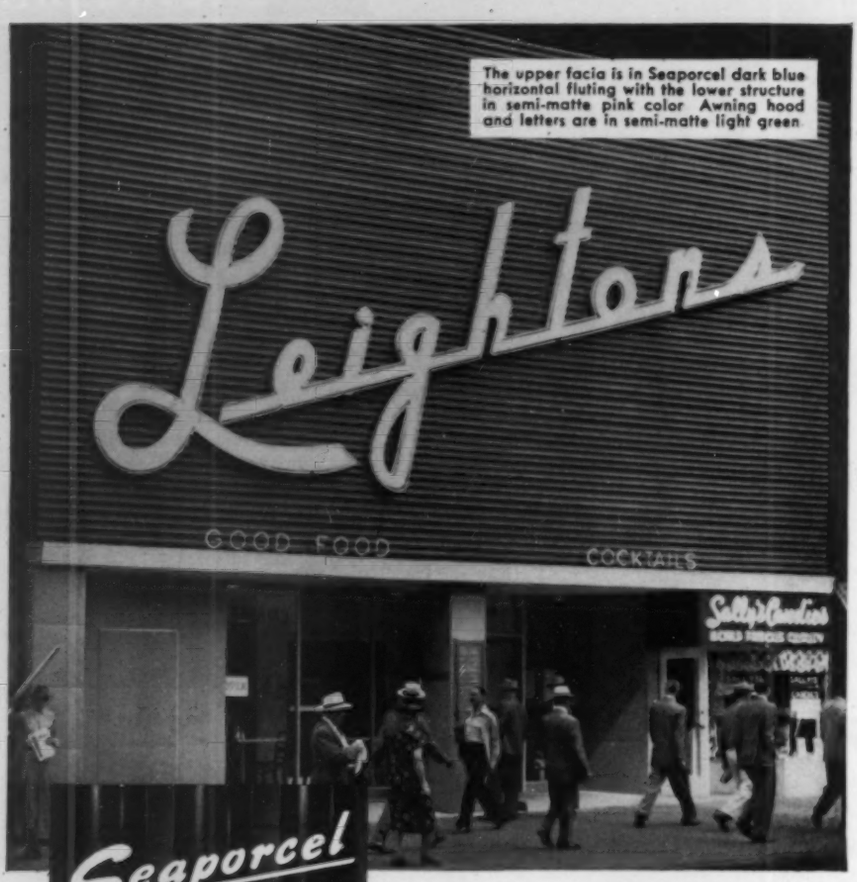
In the sketches of the cylindrical glass fronts, (b) is similar to (a) but has a smaller curve, and its effect depends upon the projected canopy to absorb the reflected rays. In both cases the soffits have to be treated with a non-reflecting coat (matte black). These windows collect dust easily and take away display space. Elliptical glass fronts are shown in (c) and (d). The double type has proved to be most satisfactory in practice

(*Continued from page 141*)

Among the optical means for preventing glare are the invisible glass panes; reflections are eliminated by either curving the glass or by tilting a flat glass panel. The required curve or inclination of the pane can be calculated so that all reflective rays may either be deflected towards a dead-black surface or baffle or entirely eliminated from the field of vision



Tilting glass panes throws the reflections outside the observer's field of vision and produces, to a certain height, glare-free windows. Reflected rays are thrown downwards in (a) and (b) where they are absorbed by free space in front of the glass and dark or shaded sidewalks. In (c) and (d) most of the reflected rays are cast towards the dark ceiling which absorbs them. In (e) and (f) the rays are absorbed by both the dark sidewalk and ceiling


The upper facia is in Seaporcel dark blue horizontal fluting with the lower structure in semi-matte pink color. Awning hood and letters are in semi-matte light green.
Leighton's
GOOD FOOD
COCKTAILS

Seaporcel
PORCELAIN ENAMEL

One of many stock dies

Architectural **SHAPED** *Parts are*

PRACTICAL

LIGHTWEIGHT • DURABLE • ECONOMICAL
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The entire facade of Leighton's new building in Los Angeles, California shows how one of a variety of Seaporcel* "shaped" parts has been applied for esthetic as well as practical value.

BEARING IN MIND the ease of installation, the negligible maintenance cost, its strength, long life and beauty of fadeless color (which is almost limitless) and you have the reasons for architects' preference for Seaporcel architectural material in designing store fronts, entire building facades and even interiors.

EXTRUDED OR REVERSE, Seaporcel "shaped" or custom fabricated parts are obtainable in such versatile surface textures as "terra cotta," "limestone," "granite," in semi-matte, matte or gloss finishes.

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*Reg. U.S. Pat. Off.

Seaporcel
Member Porcelain Enamel Institute, Inc.

THE RECORD REPORTS

(*Continued from page 16*)

the federal government channel $750 million to private lending institutions willing to make GI loans to home-seekers but which had used up their credit funds. This, it was said, probably would be administered by Veterans Administration as the bill was drafted. This point was not certain, however.

Also extreme was the proposition contained therein that if the channeling of funds to private lenders did not work, and if a broadened secondary market for GI loans failed to give the necessary relief, then Veterans Administration be empowered to make loans directly to the qualified veterans.

An interesting feature of the Rogers legislation is that dealing with public works — community facilities — for veteran developments. It provides that $50 million be made available for construction of these facilities, such as roads, sewers, water mains, etc., in those instances where such installations are not provided through other agencies. This part of the plan would be administered by the Federal Works Agency, and would supply such conveniences only in those cases where state, county or local governments failed to do so. This would be an outright appropriation without return, whereas the loan provisions call for eventual repayment to the Treasury with interest. An interest charge of "4 per cent or less" is set out.

Mrs. Rogers and her assistants are anxious to see the channeling program tried first, in connection with the expanded secondary market for GI home loans. Then, as a last resort, they would put the government in the lending business by making the loans available directly to qualified veterans through the VA.

There are certain other steps outlined in the Rogers bill, too. It would single out farm veterans for special attention.

The Massachusetts Congresswoman said her proposed law is designed to enable World War II veterans to acquire homes and farms at rentals and prices the veterans can afford to pay.

Spence Favors Controls

Rep. Brent Spence of Kentucky, who regained chairmanship of the House Banking Committee, told the ARCHITECTURAL RECORD that he favors standby controls for the President to enable him to allocate scarce building materials for housing construction. This is important since any housing legislation prepared for House consideration would pass through the Spence committee. And Rep. Spence has said there will be housing legislation.

(*Continued on page 146*)

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ELECTRIC HAND AND FACE DRYER

CUTS DRYING TIME 25% OR MORE!

• Now . . . a new, improved heating element makes Sani-Dri the fastest drying machine of its kind! Users now enjoy this modern, sanitary method of hand and face drying and do a thorough drying job in 25% *less time!* Yet, the new Sani-Dri consumes no more current than before. For new installations or modernization of old washrooms, there's nothing like the new and faster drying Sani-Dri. Write for the latest facts today!

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☐ Brochure 1082 on new, faster-drying Sani-Dri Electric Hand and Face Dryer.

☐ Brochures on complete line of restaurant stools, tables, table bases and costumers.

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City_____ State_____

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Architects can safely recommend Rust-Oleum with full confidence that it will eliminate hidden rust and possible structural failure — particularly in crawl spaces and inaccessible areas where ventilation difficulties create condensation or dampness.

If you have a rust problem, give us full information and we will gladly offer specific recommendations. See complete Rust-Oleum catalog in Sweet's Architectural and Engineering Files, or write for a copy.

RUST-OLEUM CORPORATION

2479 Oakton St., Evanston, Illinois

THE RECORD REPORTS

(*Continued from page 144*)

In the opinion of the new chairman, too much "unessential" construction work is going on now. Home building, he said, cannot compete with race tracks, bowling alleys and other structures of the recreational type since builders of the latter can "pay attractive bonuses and lure contractors" away from the home building field.

"We must make some effort to get more materials for homes," he commented. "I would favor allocation of materials from race tracks and similar building to homes."

Rep. Spence had not yet decided whether he would have a housing bill of his own. He said he wanted to consult with Administration leaders and go into the matter thoroughly before formal committee considerations were started. Until such time as the committee hearings did open, the subject of housing would be under intense study in all its aspects, the Kentucky Congressman said.

He summarized his attitude with the observation, "Building is only as effective as the shortest material permits it to be."

Materials Picture Brighter

James M. Ashley, President of the Producers' Council, looks for increased output of construction items in 1949. The producers broke all records in 1948. The men who make the brick, tile, and produce the lumber and plumbing supplies and other housing items are looking for a slightly lowered demand during the next 12 months compared with 1948. This is because only a narrow margin of increase in volume of new construction is being predicted and a firm decrease in the amount of maintenance and repair work is in prospect. Therefore, a materials supply equal to or somewhat larger than 1948's should be available in the year just begun.

The Council books show that dealers' inventories have improved substantially for most products and that the production of some building materials and equipment items has grown to the point where cutbacks have had to be effected. As the supply of all items comes up in volume, construction lumber no longer is any problem as far as supply is concerned, Ashley points out. There is no surplus of millwork, but the backlog of orders on hand has been decreasing in recent months.

More Rental Housing Urged

Mr. Spence, as well as favoring some stand-by controls for allocation of building materials, would like to see incen-

(*Continued on page 148*)

where the question is low maintenance

. . . the answer is Crane!

And that *is* the question in hotel and apartment plumbing. No apartment owner can afford plumbing that takes a lot of care—and certainly no hotel man can risk it!

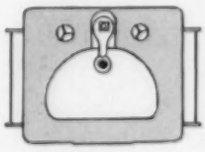
That is why, here as in the home, the natural choice is Crane. Crane alone gives *four-way* assurance of low maintenance costs (see left). Crane supplies every type and style of fixture. And Crane is the one choice with which clients are certain to agree—the best-known name in the field.

See your copy of "Crane Service for Architects" for examples of Crane hotel and apartment plumbing. And be sure to check your plans early with your Crane Branch or Crane Wholesaler.

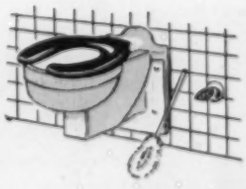
LOW MAINTENANCE—4 WAYS!

1. Simple replacement... With *Dial-ese* fingertip controls, you just slip out the worn cartridge unit, slip in the new—one *Dial-ese* unit fits all Crane faucets . . . lavatories, baths, and sinks.

2. Long life... Years of the toughest usage have proved Crane fixtures' resistance to wear. (And note how this Crane Diana Lavatory is shaped to conserve water..rounded at the basin, but plenty of room in front . . . another saving!)



3. Easy cleaning . . . This Crane Walton Closet is mounted off the floor to save on clean-up time. And how *easy*—once over with a damp cloth, and Crane fixtures shine like new!



4. One quality throughout... Every part made for every other. Crane supplies not only the fixtures themselves, but also the piping that makes them work.

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Plumbing and Heating • Valves • Fittings • Pipe

HOTEL AND APARTMENT PLUMBING • NATION-WIDE SERVICE THROUGH BRANCHES, WHOLESALERS, PLUMBING AND HEATING CONTRACTORS

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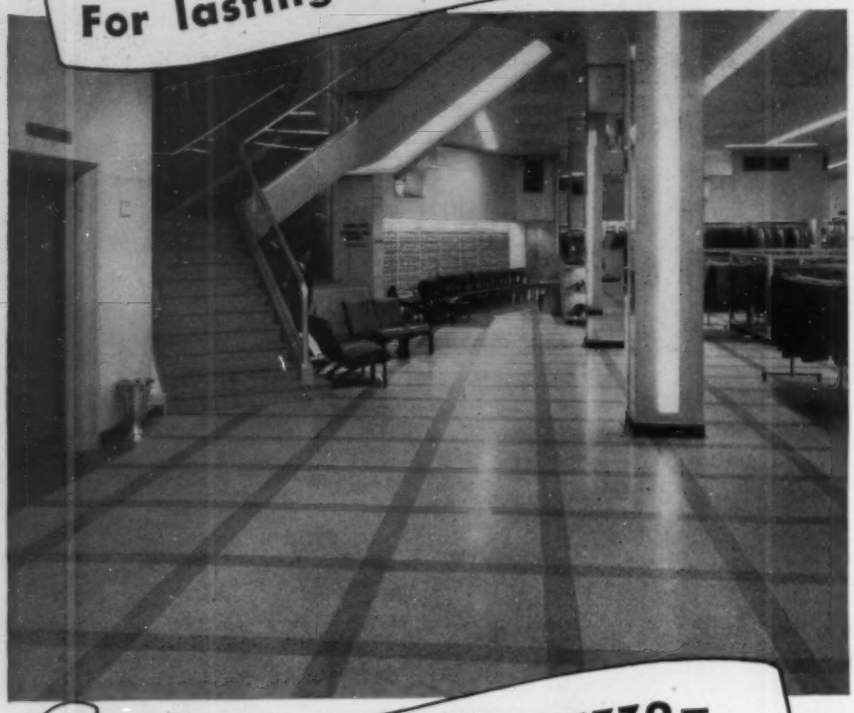

For beautiful Terrazzo—
ATLAS WHITE CEMENT

Long-lasting service . . . a bright, clean appearance. That's the combination Terrazzo brings to floors. Made with a matrix of Atlas White Cement, enduring Terrazzo floors hold their original beauty through years of constant foot traffic.

Because Atlas White Cement is outstanding for both uniformity and whiteness, color pigments and aggregates show up at their best, in either contrast or blend. An infinite variety of color tones and shadings are possible . . . not only in Terrazzo, but in Stucco, Cement Paint and Architectural Concrete Slabs.

Atlas White complies with Federal and ASTM specifications for portland cement. It has the same advantages for concrete and is used in the same way. Concrete made with Atlas White cleans easily. Maintenance costs are low.

For further information on the uses of Atlas White Cement, see SWEET'S CATALOG, Section 4B/2 and 13B/8, or write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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Sunday Evenings—ABC Network

THE RECORD REPORTS

(*Continued from page 146*)

tives legislated for more construction of rental housing. That is, he favors some help, probably in the form of financial aid, for those contractors willing to stress the building of rental units. He has said that only 15 per cent of new housing is going up in rental units. And this is not enough of the rental type to suit him. With construction costs as high as they are, he is advising veterans not to buy houses unless they have to.

He also is willing to go along with the current efforts, expressed on so many fronts, for greater economy in home building. He wants legislation to help stimulate more home building in the $10,000 and under bracket — by private enterprise. If he has his way, private builders will get the material to do the job, if government has to allocate it to them.

The Kentucky Representative was not so exact in his discussion of government participation in the financing of houses. This is a field which he believes will take much more study in view of the current drying up of the mortgage market. He sees lenders willing to take risks on uninsured loans with higher interest rates, favoring these over government-insured loans at lower rates of interest. It is a condition requiring close scrutiny by Congress, and action to correct if that is found necessary, he observed.

VA Will Not Raise Loan Rates

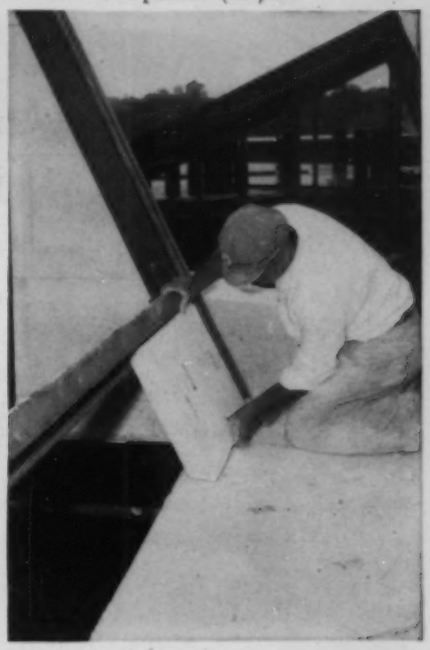
A new tinge was placed on the home financing picture early last month when the Veterans Administration made the flat assertion it would not raise the interest rates on GI loans from 4.0 per cent to 4.5 per cent. VA was given the privilege of raising the rate by the last Congress; it could have voluntarily pushed the figure up to 4.5 per cent with the consent of the Secretary of the Treasury. But the agency conducted its own survey of the mortgage market, consulted with other federal finance agencies, and, after many months of speculation in industry, came out with its statement on January 3.

This development was expected to release some credit for home construction that had been held back by uncertainty as to VA's position. Many segments of the home construction industry had complained that the 4 per cent figure offered by VA conflicted with the 4.5 per cent which Federal Housing Administration permits on its own guaranteed home loans. There was no doubt that VA's final firm decision in the matter, while

(*Continued on page 150*)

KAYLO ROOF TILE can be laid on standard structural shapes, or on rail-type or hollow-box sub-purlins attached to purlins (left).

EASY TO HANDLE, Kaylo Roof Tile slips into place on sub-purlins. Kaylo Roof Tiles are so light they can be easily distributed over the roof deck directly to points of application.



KAYLO ROOF TILE can be cut to fit with ordinary hand or power tools. *Above:* Tile is beveled and fitted on angular skylight.

This structural roof deck insulates

IN EVERY roof deck of Kaylo Insulating Roof Tile, there's a unique combination of advantages that can be found in no other type of roof deck:

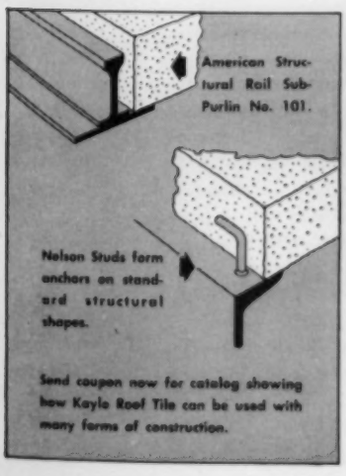
It's lightweight. The tile weighs less than 6 pounds per square foot.

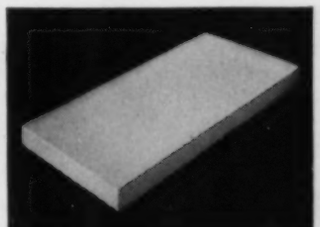
It insulates. Here, in one material, is thermal insulation and structural strength. Kaylo Insulating Roof Tile has insulation value equal to an inch and a half of standard insulating board.

Does not burn. Kaylo Roof Tile withstands building fire temperatures (as defined by the standard A.S.T.M. fire curve) for more than one hour without permitting a temperature rise on the cold side great enough to constitute failure.

Get *all* the facts about this remarkable new roof deck material. Send in the coupon below.

UNDERSIDE OF KAYLO ROOF DECK forms a completed ceiling, without treatment or painting. It reflects light, raises illumination levels. Top side is covered with built-up roofing, as shown above.


American Structural Rail Sub-Purlin No. 101.
Nelson Studs form anchors on standard structural shapes.
Send coupon now for catalog showing how Kaylo Roof Tile can be used with many forms of construction.



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- ☐ Illustrated booklet, "Kaylo Insulating Roof Tile."
- ☐ Free sample of Kaylo Roof Tile.
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Back wall panels are white vitreous porcelain enamel, glass panels set in solid brass chromium plated frame. Receptor deep type terrazzo generous size with overall dimensions 40"x40"x80". Architects, Builders and home owners will welcome back this Fiat shower cabinet that typifies luxury shower bathing equipment.

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In Canada Fiat showers are manufactured by Porcelain and Metal Products, Ltd., Orillia, Ont.

THE RECORD REPORTS

(*Continued from page 148*)

continuing the "double standard of interest rate" on insured loans, would release some credit held back by lending institutions which waited to see which way the veterans' agency would decide to jump. But the extent of this released volume could not be appraised accurately.

The home builders themselves, through their National Association, called for an improved secondary market to relieve the "serious tightening of mortgage lending during the last four months." N.A.H.B. looked for both good and bad housing legislation to be enacted in the first three or four months of the new session of Congress — now just one month old. "It is our job," said N.A.H.B., "to support whatever bills will assure a continuance of the present volume production for veterans and others and to oppose uncompromisingly all legislation which would place the federal government in control of the industry through construction and operation of public housing, through the control of local slum clearance, etc."

Cooperatives Gaining Slowly

More is certain to be heard of the realtors' cooperative housing plan which is modeled after the one in existence in Sweden for so many years. The National Association of Real Estate Boards appointed a special committee to go into the subject of cooperatives and see if that should be offered as the N.A.R.E.B. solution to the current housing problems, and it seems likely that the plan will form the basis of any recommendations to be made by that body. N.A.R.E.B. claims such a system of cooperative home building, wherein individual groups initiate projects, would keep the whole framework of home construction in the hands of private enterprise even though government financial assistance is involved.

The government already has stepped up the tempo of its cooperative activities under the Housing Act of 1948. Thomas S. Gray, an authority in the field, has been named to head up an office on Cooperative Housing and Yield Insurance. Looking upon these as comparatively new fields, the Federal Housing Administration extends the services of the new office to help solve problems of corporations, charters, by-laws and contract documents involved in setting up a cooperative to build houses.

The plan as it is now operating under the law passed last summer, permits non-profit cooperatives to establish themselves to build either detached or multiple-family dwelling units for occupancy

(*Continued on page 152*)

Mesker Steel Windows

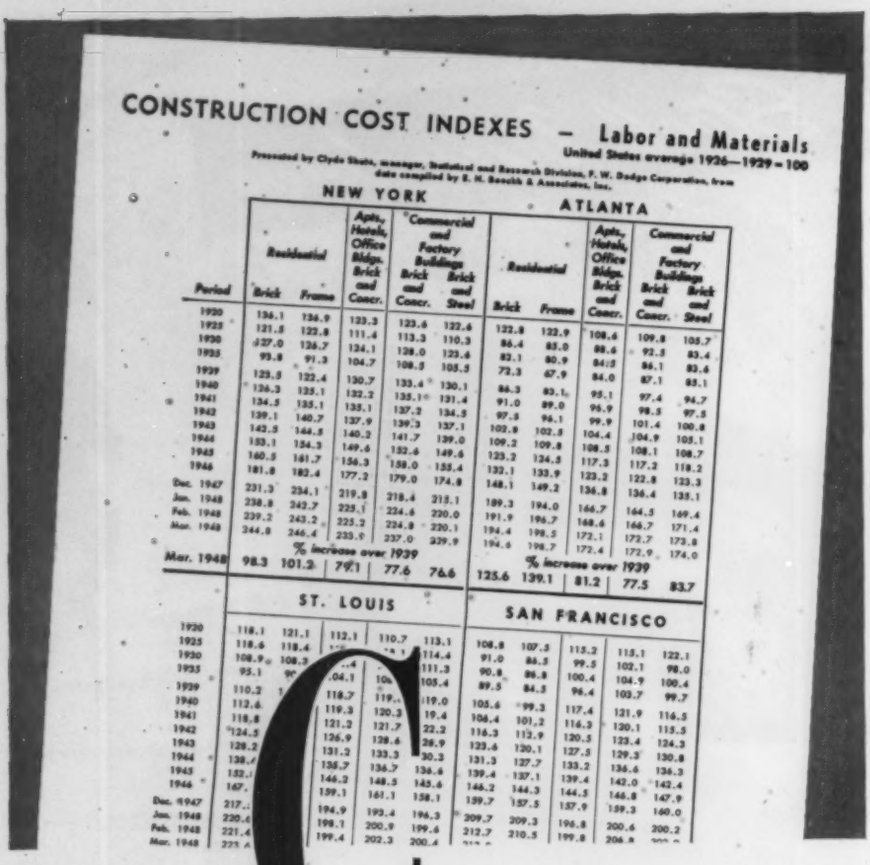
ETHYL CORPORATION
Development Laboratory and Pilot Plant
BATON ROUGE, LA.
Architect:
Bodman & Murrell, Baton Rouge
Contractor:
R. P. Farnsworth & Co., Baton Rouge

Because windows, once installed, should be largely forgotten, it is doubly important to remember Mesker Windows in the planning stage. The Mesker Steel Windows used in this building are constructed for long, low-maintenance service, smooth operation and permanent weathertightness so they can be forgotten, except for continued satisfaction over the years.

MESKER INTERMEDIATE AND ARCHITECTURAL PROJECTED WINDOWS

These popular steel windows have been installed in some of the country's leading schools, banks, factory offices, stores and public buildings. Members 1¾" deep are extra heavy, extra strong. Available with and without hopper ventilators in a wide range of heights and widths. See the Mesker Catalog in Sweet's, or write for detailed data sheets.

MESKER BROTHERS, METAL WINDOWS • 4338 GERALDINE AVENUE • ST. LOUIS 15, MISSOURI



CONSTRUCTION COST INDEXES — Labor and Materials

United States average 1926—1929 = 100

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corporation, from data compiled by E. H. Boeckh & Associates, Inc.

NEW YORK

Period	Residential Brick	Residential Frame	Apts., Hotels, Office Bldgs. Brick and Concr.	Commercial and Factory Buildings Brick and Concr.	Commercial and Factory Buildings Brick and Steel
1920	136.1	136.9	123.3	123.6	122.6
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1941	134.5	135.1	135.1	137.2	134.5
1942	139.1	140.7	137.9	139.3	137.1
1943	142.5	144.5	140.2	141.7	139.0
1944	153.1	154.3	149.6	152.6	149.6
1945	160.5	161.7	156.3	158.0	155.4
1946	181.8	182.4	177.2	179.0	174.8
Dec. 1947	231.3	234.1	219.8	218.4	213.1
Jan. 1948	238.8	242.7	225.1	224.6	220.0
Feb. 1948	239.2	243.2	225.2	224.8	220.1
Mar. 1948	244.8	246.4	233.0	237.0	229.9
	% increase over 1939				
Mar. 1948	98.3	101.2	79.1	77.6	76.6

ATLANTA

Period	Residential Brick	Residential Frame	Apts., Hotels, Office Bldgs. Brick and Concr.	Commercial and Factory Buildings Brick and Concr.	Commercial and Factory Buildings Brick and Steel
1920	122.8	122.9	108.6	109.8	105.7
1925	86.4	85.0	88.6	92.5	83.4
1930	83.1	80.9	84.5	86.1	83.6
1935	73.3	67.9	84.0	87.1	83.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1941	97.5	96.1	99.9	101.4	100.8
1942	102.8	102.8	104.4	104.9	105.1
1943	109.2	109.8	108.5	108.1	108.7
1944	123.2	124.5	117.3	117.2	118.2
1945	132.1	133.9	123.2	122.8	123.3
1946	148.1	149.2	136.8	136.4	138.1
Dec. 1947	189.3	194.0	166.7	164.5	169.4
Jan. 1948	191.9	196.7	168.6	166.7	171.4
Feb. 1948	194.4	199.5	172.1	172.7	173.8
Mar. 1948	194.6	198.7	172.4	172.9	174.0
	% increase over 1939				
Mar. 1948	125.6	139.1	81.2	77.5	83.7

ST. LOUIS

Period					
1920	118.1	121.1	112.1	110.7	113.1
1925	118.6	118.4			114.4
1930	108.9	108.2			111.3
1935	95.1	9[illegible]	04.1	10[illegible]	105.4
1939	110.2	1[illegible]	118.7	119[illegible]	119.0
1940	112.6		119.3	120.3	19.4
1941	118.8		121.2	121.7	22.2
1942	124.5		126.9	128.6	28.9
1943	128.2		131.2	133.3	30.3
1944	138.4		135.7	136.7	136.6
1945	152.1		146.2	148.5	145.6
1946	167.		159.1	161.1	158.1
Dec. 1947	217.		194.9	193.4	196.3
Jan. 1948	220.4		198.1	200.9	199.6
Feb. 1948	221.4		199.4	202.3	200.4
Mar. 1948	223.4				

SAN FRANCISCO

Period					
1920	108.8	107.5	115.2	115.1	122.1
1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1941	116.3	112.9	120.5	123.4	124.3
1942	123.6	120.1	127.5	129.3	130.8
1943	131.3	127.7	133.2	136.6	136.3
1944	139.4	137.1	139.4	142.0	142.4
1945	146.2	144.3	144.5	146.8	147.9
1946	159.7	157.5	157.9	159.3	160.0
Dec. 1947	209.7	209.3	196.8	200.6	200.2
Jan. 1948	212.7	210.5	199.8	206.8	

What will it Cost?

That's the client asking. And every day, everywhere in the United States, the architect's answer is deciding whether thousands of new buildings are to go ahead.

The architect and engineer need dependable cost information. They get it in the regular and *exclusive* Architectural Record feature above, compiled by E.H. Boeckh & Associates. Which is one more reason why architects and engineers *reach* for the *Record* . . .

. . . and why Architectural Record is *first*, among all architectural publications, in architect circulation, in consulting engineer circulation, in number of advertisers and total pages of advertising carried. Architectural Record is the *workbook of the architect-engineer.*

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- ☐ 6-month 1948 analysis of architect-engineer-planned work by dollar volume and numbers and kinds of projects.
- ☐ 8-month 1948 analysis of architectural advertising by product classifications and by publications.
- ☐ Who writes specifications? A survey of architectural offices.
- ☐ 8-month 1948 chart of advertising volume in the architectural field.
- ☐ Six regional studies of coverage of planning and specifying activity.
- ☐ How "controlled-paid" circulation is influencing the sale of your product today.
- ☐ A simple summary of architect and engineer circulation, by publications.
- ☐ How the mathematics of architecture guides the specification of your product.
- ☐ Pointers on writing architectural copy — a check list for advertisers.

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FIRM.....

STREET.....

CITY.....

(Please clip to your letterhead)

THE RECORD REPORTS

(Continued from page 150)

by the members. Twelve or more family units of the detached type must be built by each group so established.

If any such group consists primarily of World War II veterans (75 per cent or over), the principal obligation of the venture can be insured for 95 per cent of the amount the FHA administrators estimate as the replacement cost on the basis of conditions prevailing on December 31, 1947. This type of cooperative, then, is set up on an "estimated cost" of construction basis.

The second type of loan insurance is offered to any group composed of a mixture of veterans and non-veterans where the veterans number less than 75 per cent of the total. In such instances, the loan is insured up to 90 per cent of the amount the FHA administrator estimates as the value of the properties when completed.

There are certain strings attached to this type of cooperative home building, too. For one thing, a need for the dwellings proposed in the community where they are to be built must be determined by the FHA administrator before construction can proceed. This is not a serious point now, with the housing shortage still acute, but it could present complications at a later date when the shortage is relieved and veterans or others want to group together to build for themselves in communities already adequately supplied.

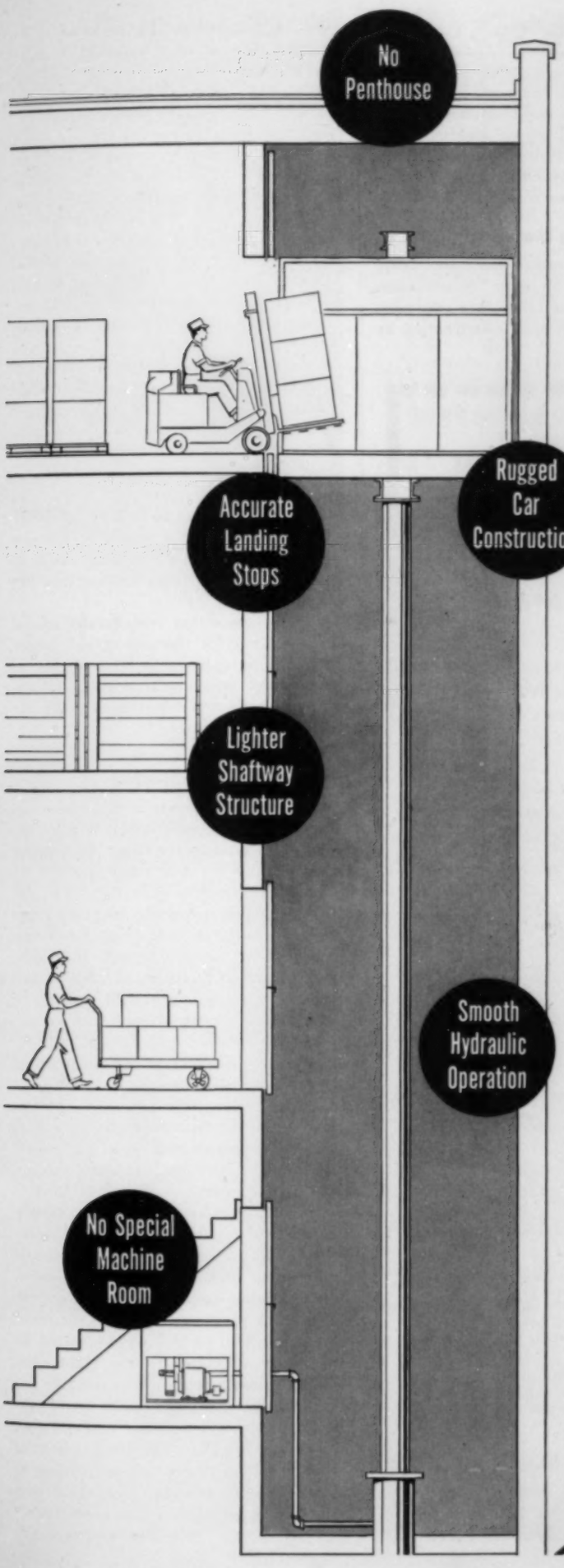
Though the cooperative law was passed some seven months ago, there has not been much activity under it so far. At the beginning of 1949 only two projects were under consideration, one of them at the commitment stage.

The purpose of the yield insurance, of course, is to attract investment capital into the production of rental housing for families of moderate income where no mortgage financing is involved.

Under the provisions of Title VII of the National Housing Act, the FHA is authorized to insure the minimum annual amortization charge of 2 per cent of the established investment plus an annual return of 2.75 per cent of the outstanding investment. Established investment means all approved costs prior to initial occupancy.

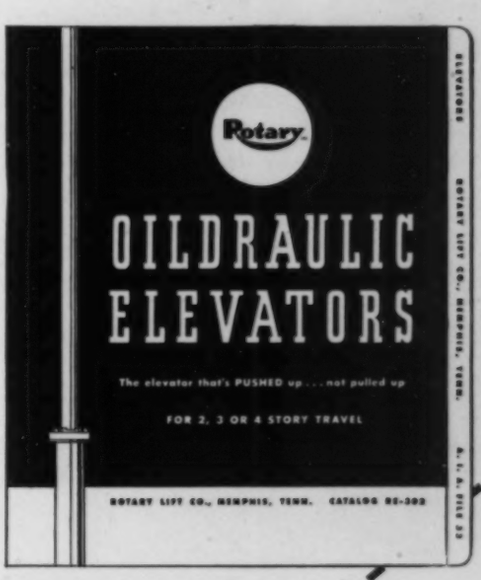
True, these provisions of the Act have been in effect only since last August and, as FHA points out, a great deal of interest has been shown. But it cannot be said that the cooperative housing and yield insurance portions of the law have "taken" as yet. The naming of Gray as a special assistant was a move toward stimulating activity in these two fields.

(Continued on page 154)



A Rotary Oildraulic is the most practical elevator for 2, 3 or 4 stories

You can simplify your plans and streamline your building designs. The Oildraulic Elevator requires no costly, unsightly penthouse because it's *pushed up* from below by a powerful hydraulic jack . . . not pulled from above. This also makes possible a lighter shaftway structure . . . no need for heavy load-bearing supporting columns. No special machine room is required, either, for the compact Oildraulic power unit. Other features that please building owners are smooth operation, accurate landing stops, rugged car construction, and economical service.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Address.....

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PBA Surveying Plant Needs

Besides the defense program effects on fuel, the architect must watch as well another defense development mentioned previously by the ARCHITECTURAL RECORD — the National Industrial Reserve program under the Federal Works Agency. Industrial surveys are being made by the Public Buildings Administration under FWA after taking over of industrial plants needed for defense (plants used during the recent war but not now in use) to determine the work required to put each plant in condition for its originally designed purpose and capacity. Repairs and stand-by preparation will be done either by contract or by custodial maintenance forces.

School Building May Boom

Government economists are fairly confident that a home construction slump, should one take place this year, would bring forth more construction by local governments. It is known, of course, that a vast number of local school board bond issues have been authorized; throughout the country various town councils merely await better terms from the contractors.

School building is especially likely in the suburbs of almost every large city. Homes and apartments have been going up rapidly; many will be ready for occupancy this spring. Families that seem to be doubled up in town will move. Already overcrowded suburban schools will have to accommodate more children. There will be pressure to put up schools regardless of present costs.

Should industrial and home construction taper off, as some of the economists expect, construction by local governments probably would go ahead even faster than otherwise. Most estimates hold that such construction will be necessary over the next several years. The expense won't have to be borne entirely by present home owners, who already complain about high property taxes; it will be shared by those moving into the new dwellings.

In this connection, considerable school construction for the segregated Negro populations appears to be probable in the border and southern states. Plans include both new construction and repair of old buildings.

Federal Building Studied

The federal government's delay in some of its western construction programs, such as major dams, because of the need to let home building get at least partly caught up first, came to the fore in recent corporate profit hearings of the Congressional Joint Economic Committee. Accompanying the comment was the question of whether the federal government should put up a steel plant to help produce steel for the nation's overall construction requirements. President Truman's inclusion of this idea in his State-of-the-Union message to Congress last month was not wholly unexpected: Senatorial members of the Committee had let drop the word that such a proposal was being pressed in some quarters, and unless steel is forthcoming in quantities more nearly to meet the need, the threat of a government plant might take the form of actual entry into steel production. Steel men, on the other hand, claim that merely building a plant won't answer the problem, that two or three years would be necessary to complete the plant, and that raw materials such as suitable ore and coal for the ore furnaces would present a real problem. Some contend that raw materials aren't sufficiently plentiful to continue as much steel production as is now being recorded, let alone permitting an increase in that capacity.

(*Continued on page 156*)

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RIXSON

Concealed Door Closers

FROM TOP..

TO BOTTOM

Superiority in RIXSON engineering and construction assure the satisfactory functioning of RIXSON concealed door closers even under the most exacting conditions. During half a century of leadership in this field, RIXSON checking floor hinges have never failed mechanically due to the admittance of foreign matter into the sealed hinge housing. *There is no question of RIXSON dependability.*

Special problems of installation will receive prompt attention from the Rixson engineering and designing departments.

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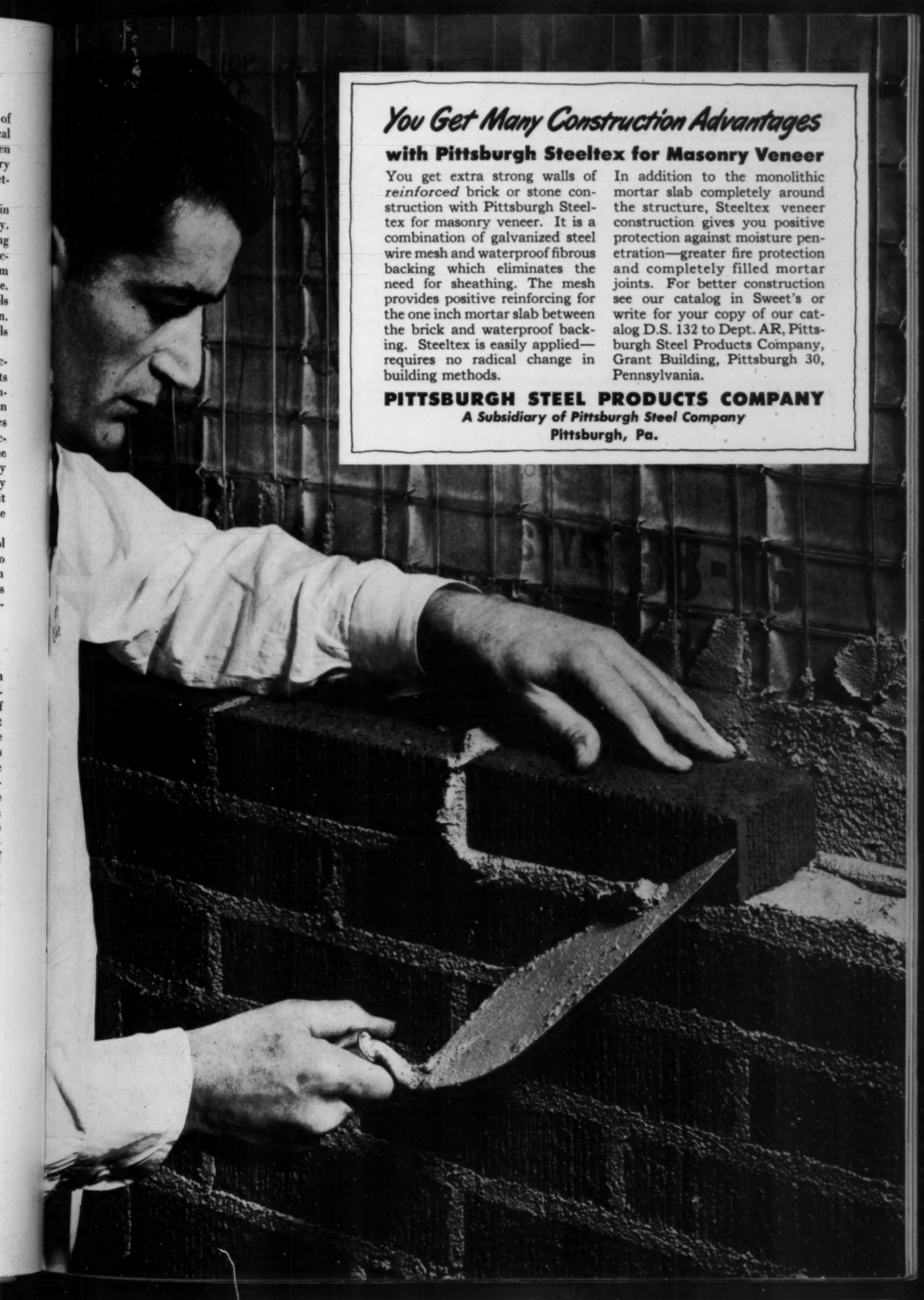
You Get Many Construction Advantages
with Pittsburgh Steeltex for Masonry Veneer
You get extra strong walls of *reinforced* brick or stone construction with Pittsburgh Steeltex for masonry veneer. It is a combination of galvanized steel wire mesh and waterproof fibrous backing which eliminates the need for sheathing. The mesh provides positive reinforcing for the one inch mortar slab between the brick and waterproof backing. Steeltex is easily applied—requires no radical change in building methods.
In addition to the monolithic mortar slab completely around the structure, Steeltex veneer construction gives you positive protection against moisture penetration—greater fire protection and completely filled mortar joints. For better construction see our catalog in Sweet's or write for your copy of our catalog D.S. 132 to Dept. AR, Pittsburgh Steel Products Company, Grant Building, Pittsburgh 30, Pennsylvania.
PITTSBURGH STEEL PRODUCTS COMPANY
A Subsidiary of Pittsburgh Steel Company
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THE RECORD REPORTS (*Continued from page 154*)

Uniform Standards to be Issued

HHFA's Division of Standardized Building Codes and Materials is working on uniform standards designed eventually to include each broad category of building regulation based upon the application of engineering principles determined as a result of scientific tests and research and the consensus of the best professional judgment. These uniform standards, it is explained, are to be issued in such form that they will be suitable for direct incorporation by code writing authorities into building codes. They will refer to such subjects as use and occupancy, light and ventilation, structural design and quality for walls, floors, ceilings, roofs, foundations and connections, materials, sanitation and gas piping, heating systems, electrical systems, and fire resistive construction. The Division also plans to develop technical information about new materials and new methods of construction.

Moisture Destroys Insulation Values

"'Moisture increases the rate of heat transfer through a material, because water, which fills the pores or voids, conducts heat more rapidly than air". . . . . *Third edition of "Insulation," by Paul D. Close as Technical Secretary of Insulation Board Institute and former Technical Secretary of the American Society of Heating and Ventilating Engineers.*

Infra is impermeable to water vapor

INFRA — multiple sheet aluminum insulation — is the best way to insulate a basementless house. It is non-condensation-forming. Easy to install, in crawl spaces, for instance. Infra excels as thermal insulation, preventing heat from entering or escaping. Note the remarkable results for DOWNWARD heat flow. These values are permanent. The insulation will remain in place and not tear at the staples or elsewhere because of moistened paper and excessive weight.

The scientific construction of Infra, with multiple separated aluminum sheets, provides 4 reflective spaces and 4 reflective surfaces, each non-condensation-forming and 97% effective against heat rays. The two sheets of aluminum and the accordion partition block convection currents. The two rows of inner, alternating triangular air spaces, and the small mass eliminate conduction as a problem.

Infra C Factors and Rockwool Equivalents

C.052 Heat Flow Down, equals 6" Rockwool.
C.083 Heat Flow Up, equals 3.97" Rockwool.
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Thermal Factors on Every Infra Carton

MULTIPLE ACCORDION ALUMINUM and TRIANGULAR REFLECTIVE AIR CELLS

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32-Page Booklet: "Simplified Physics of Thermal Insulation."
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ON THE CALENDAR

Through March 19: "Piranesi Drawings," exhibition of 79 drawings by Giovanni Battista Piranesi, 18th century Italian architect and etcher, The Pierpont Morgan Library, 29 E. 36th St., New York City.

Through March 20: "American Paintings from the Museum Collection," exhibition at the Museum of Modern Art, New York City.

Feb. 11-23: Exhibition of modern architectural rendering and small sculpture, Architectural League of New York, 115 E. 40th St., New York City.

Feb. 12–20: 1949 Home Show of St. Louis, Kiel Auditorium, St. Louis, Mo.; sponsored by the Home Builders Assn. of Greater St. Louis.

Feb. 20–24: "Home Building's Parade of Progress," Annual Convention and Exposition of the National Assn. of Home Builders, Stevens Hotel, Chicago.

Feb. 28–March 4: 1949 Spring Meeting and A.S.T.M. Committee Week, Hotel Edgewater Beach, Chicago.

March 4–indefinite: "Ancient Art of the Near and Middle East," exhibition at the Metropolitan Museum of Art, New York City.

March 14–17: Chicago Technical Societies Conference and Show, Hotel Stevens, Chicago.

March 15–18: 81st Annual Convention of the American Institute of Architects, Rice Hotel, Houston, Texas.

March 29–April 1: 3rd National Lighting Exposition, Chicago.

April 11–April 15: Sixth Western Metal Congress and Exposition, Shrine Auditorium, Los Angeles.

PURVES SUCCEEDS KEMPER AT HELM OF THE A.I.A.

Edmund R. Purves, Director of Public and Professional Relations of the American Institute of Architects for the past two years, has been appointed Executive Director of the Institute to succeed Edward C. Kemper, who retired on December 31 after 35 years of service.

"We members of the profession will always be in Mr. Kemper's debt for his leadership and his able management during the past 35 years," A.I.A. President Douglas W. Orr said in making the double announcement. "We are gratified, however, that his successor has had the opportunity to work in the present organization and has benefited thereby from Edward Kemper's years of experience. We are sure that the Institute will continue along the path of success under Edmund Purves' direction as it has in past years with Edward Kemper at the helm."

When Mr. Kemper first joined the A.I.A. in 1913, Mr. Orr said, the organization had only 37 chapters and

(*Continued on page 158*)

Its *Simplicity*

is your assurance of efficiency

The Delany Flush Valve has only 6 moving parts, the simplest assembly of any flush valve and the quickest and easiest to repair.

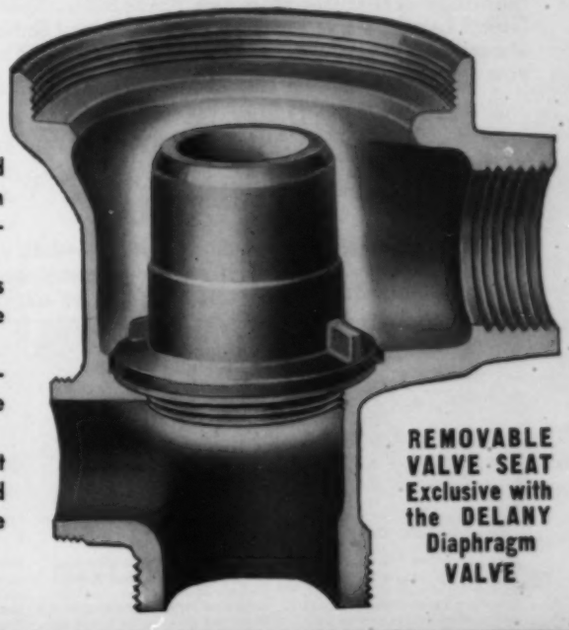
The *RENEWABLE* DELANY Main Valve Seat, (illustrated right) combined with all the other renewable minimum number of parts (illustrated above) insures lowest possible replacement costs.

The ACCESSIBILITY when repairs are necessary, insures quick replacements of all parts, thus reduces maintenance man hours to the absolute minimum.

The vital factor, when these quick and easy replacements are completed — the initial efficiency of the DELANY VALVE is INSTANTLY REGAINED.

Definitely, these features are indisputable proof, that the DELANY VALVE is truly a lifetime installation, and not assumed to be, by inference or association with the permanent fixtures it services.

Available thru all leading supply houses.



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1159 members. Today it has 88 chapters, six State Association and six State Organization members and more than 7800 individual members.

Mr. Kemper is a native of Staunton, Va., and has been a member of the bar in the District of Columbia since 1912, a year after he completed his law studies at George Washington University. From 1912 to 1914 he served as secretary to the Secretary of the Interior, Franklin K. Kane. In February of the latter year he became Executive Secretary of The American Institute of Architects and Executive Director of the Institute in 1946, when the title of the office was changed. In recognition of his service to the architectural profession he was elected an Honorary Member of the A.I.A. and an Honorary Associate of the Royal Institute of British Architects in 1946.

Mr. Purves, a native of Philadelphia, received his B.S. in Architecture from the Architectural School of the University of Pennsylvania. Registered in Pennsylvania, New Jersey and Rhode Island, and a Fellow of the A.I.A., he has held a number of posts in architectural societies. He has served as president of the Pennsylvania Society of Architects, was regional director of the A.I.A. from 1938 to 1941, and in 1946 was a delegate to the International Technical Congress in Paris. He first joined the A.I.A. executive staff in Washington in 1941, serving as their Washington representative for a year. Following a three year leave of absence for military service he returned to the Institute and in 1946 was made Director of Public and Professional Relations.

Edmund R. Purves of the A.I.A.

At last...a brand new building material...WOOD!

● Let's suppose you're designing a theater. You need a roof span of 200 feet... with no posts for movie fans to sit behind. We'll detail and build *wood* trusses to fit that job. They'll be Rilco Glued Laminated trusses. Every bit of wood that goes into them will be specially selected for density, strength and grain structure. They'll be permanently bonded by modern improved glues. They'll be delivered to the site completely built... ready to be put in place by the contractor's regular carpentry crew.

Rilco has truly made wood a new building material... has given it amazing new versatility and usefulness and strength. Your designs need no longer be hampered by the limitations of lumber's traditional sizes and shapes. Give your imagination and your skill a free hand. Give your buildings real distinction and practicality. Specify Rilco Glued Laminated Wood Trusses, Arches and Rafters. There are many standard types and our engineers will work with you on your own designs.

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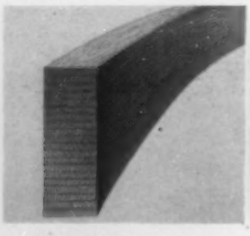
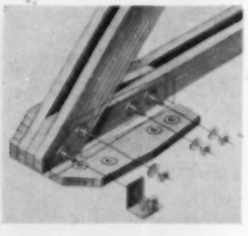
EXHIBITION HALLS • SPORTS ARENAS • BOWLING ALLEYS • STORE BUILDINGS

Rilco Laminated Trusses, Arches and Rafters are expertly designed by structural engineers. Standard types fit many needs and special trusses can be built to your design and specification.



Only selected, thoroughly seasoned woods are used in Rilco Trusses. Each piece is carefully inspected for quality and grain. Improved glues make bonds as strong as the wood itself.



Modern metal connectors are used at every truss joint. They develop 80% more of the usable strength of the wood than ordinary bolt connectors and weigh one tenth as much.

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WITH THE A.I.A.

Wright to Receive Gold Medal

One of the highlights of the A.I.A. convention at Houston next month will be the presentation of the Gold Medal of the Institute to Frank Lloyd Wright, "dean of American architects." The award was voted by the Board of Directors "in recognition of Mr. Wright's distinguished contribution to the profession of architecture."

Mr. Wright is probably the world's most honored architect: he is an honorary member of the American Institute of Decorators and the National Institute of Arts and Letters, the Academie Royale des Beaux Arts D'Anvers, the National Academy of Cuba, the Instituto Central de Architectos in Brazil, the Royal Institute of British Architects, the National Academy of Architects in Mexico and the National Academy of Finland. Other honors include the Royal Gold Medal of the Royal Institute of British Architects, conferred upon him by King George VI in 1941.

Honor Awards Program Announced

Early last month it was announced that for the first time a National Honor Awards program has been set up by the A.I.A. to designate the best residences and schools which have been completed in the past four years. The program is

(*Continued on page 160*)

Dry fresh paint and plaster in almost ½ the time . . . with

the new FRIGIDAIRE Electric Dehumidifier

Now you can put new rooms or offices into use days ahead of time! Install Frigidaire Electric Dehumidifiers that dry out fresh paint and plaster in almost ½ the time . . . one unit will take as much as four quarts of water out of a newly plastered room overnight!

Its all-steel construction, light weight (85 lbs.) makes it easily portable . . . plugs into any 115v. 50/60 cycle outlet. Operation is completely automatic. Powered by the famous Frigidaire Meter-Miser mechanism, cuts current cost and has a 5-year warranty.

Prevent moisture damage in these places, too!

The Frigidaire Electric Dehumidifier is an appliance of "one-hundred-and-one" uses. Among the many places it can be used to excellent advantage are rooms where merchants store:

- Shoes
- Luggage
- Furniture
- Hardware
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- Sporting goods
- Photographic supplies
- Linens
- Drugs

Reduce dampness; stop rust, mold and mildew in —

- Club locker rooms
- Pressing rooms
- Candy kitchens
- Bank vaults
- Bakeries
- Photographic dark rooms
- Libraries
- Organ lofts
- Home basements
- Home workshops
- Industrial kitchens
- Scientific laboratories

This revolutionary new Frigidaire appliance pays for itself in the protection it affords and the time its saves.

FRIGIDAIRE Makes a Good Building Better

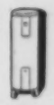
Facts about these Frigidaire Products yours for the asking

Check this list of Frigidaire products you want to know about—sign your name and address and mail to Frigidaire Division, Dayton (1), Ohio. (In Canada, Leaside 12, Ontario), or see your Frigidaire Dealer—find his name in Classified Telephone Directory.

Household Refrigerators
☐ 9 models from apartment house 6 cu. ft. to "Tandem" 14.5 cu. ft.

Electric Ranges
☐ 7 models from apartment house RK-3 to RK-70 which has two Twin-Unit Even-Heat ovens.

Electric Water Heaters
☐ 30 to 80 gals. Magnesium Rod checks corrosion and "red water."



Automatic Washer
☐ Live-Water action; all porcelain; one-piece, sealed, Unimatic mechanism; warranted.

Electric Ironer
☐ Full, 30-inch, open-end roll, Prestoe-Matic foot operation.

Automatic Electric Dryer
☐ Dries washer-load of clothes in 15 to 25 minutes automatically.

Home Freezers
☐ 8 cu. ft., Meter-Miser mechanism. Others up to 26.5 cu. ft. size.

☐ **Electric Dehumidifier**
☐ **Air Conditioners**
☐ **Water Coolers**
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City . . . . . *State* . . . . . .

planned as an annual event, with other types of building scheduled for judging in future years.

Each chapter of the A.I.A. will submit entries of photographs and reproductions of plans for homes and schools that have been designed by corporate members of the Institute and completed since January 1, 1945. The buildings must be located in the United States or its territories and possessions. Winners will be announced at the A.I.A. convention at Houston next month, and as many of the entries as can be accommodated will be exhibited at that time. Certificates will be presented to the winners.

Albert F. Heino, of Chicago, is chairman of the committee handling the program. Serving with him are: Harold R. Sleeper, New York, vice-chairman; Richard M. Bennett, Chicago; Samuel E. Lunden, Los Angeles; and Charles F. Cellarius, Cincinnati, ex-officio. Judging will be done by two national juries — one for schools and the other for homes — each consisting of one layman and four architects.

YOU DEMANDED THIS MASSIVE SHINGLE

For a long time architects and builders have been demanding an asphalt shingle with these features: Greater thickness, greater rigidity, greater protection through increased headlap and a longer life span.

HERE IT IS... "The Architect", a new shingle designed especially by Bird & Son to meet the most exacting specifications:

- *Thick massive butts,* approximating slate or wood shingles in caliper . . . heavy shadowlines.
- *Weight 290 pounds per square*... the perfect balance of greater saturation and heavier coating of life-giving asphalt.
- *Triple coverage, 5" headlap* ... Major factors in long-lived protection against standing snow and driving winds and rains.
- *Surfaced with larger mineral granules*... outstanding appearance, better adhesion, longer surface protection.
- *Greater rigidity* because of the heavier felt base, more asphalt and heavy, coarse mineral granules.
- Cost of "The Architect" *is in the asphalt shingle price* range . . . a prime selling feature for this rich, luxurious shingle.

Write today for folder showing the wide variety of colors and blendes. Bird & Son, inc., East Walpole, Mass.

BIRD & SON inc. Established 1795

COMPETITIONS ANNOUNCED

Brooklyn Chapter, A.I.A.

The Brooklyn Chapter, A.I.A., has announced the 19th architectural competition conducted annually by the Chapter. The subject this year will be a Youth Center Building to serve as a model in neighborhoods and communities in which there exists a pressing need to meet the growing problem of juvenile delinquency.

The competition is open to all students who have legal residence in the territorial area of the Chapter, who attend accredited Schools of Architecture anywhere in the United States, and to architectural draftsmen employed in or residing in the territorial area. Prizes will be awarded as follows: first, $100; second, $50; third, $25. Further information may be obtained from Vito P. Battista, Chairman, Committee on Education, Brooklyn Chapter, A.I.A., 26 Court St., Brooklyn, N. Y.

Stewardson Memorial Scholarship

The Managing Committee of the John Stewardson Memorial Scholarship in Architecture has announced a competition for a scholarship of the value of $1300, the holder of which is to pursue the study of architecture in this country or abroad as determined by the Committee and under its direction.

Citizens of the United States who shall have studied or practiced architecture in the state of Pennsylvania for the period of at least one year immediately preceding the scholarship award are eligible to compete. Candidates must be not less than 22 or more than 32 years of age on March 15, 1949.

Applicants are required to forward to the Committee not later than March 15, 1949, the information called for in the Registration Blank which will be provided upon request by the Secretary, Henry D. Mirick, Room 809, 12 S. 12th St., Philadelphia 7, Pa.

Welded Bridges

A new award program to advance the progress of welded bridge design has been announced by the trustees of the James F. Lincoln Arc Welding Foundation. The program offers awards to bridge or structural engineers for the best designs of a specified, welded highway bridge: $3000 as a first award; $1500, second; $750, third; and 10 honorable mention awards of $100 each.

Complete details of the program may be obtained from The James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio. The competition opened on January 1, and closes on June 30.

(*Continued on page 162*)

Washrooms rank as one of the four most important factors in good working conditions—according to a survey of workers from 400 plants.

In these hands... employee relations at work

Well kept washrooms help demonstrate the consideration a company holds for its employees—and customers, too. Don't *you* feel a firm is inconsiderate when the washroom isn't *right?*

Clean, *modern*, *carefully* planned washrooms show thoughtfulness for the other person. You're doing your client a real service by making sure his washrooms *are* right.

ScotTissue Towels are a symbol of the right kind of washroom. Include ScotTissue Towel cabinets in your washroom planning. Send for our free booklet that's filled with helpful suggestions, well-tested plans and diagrams (by an architect specializing in this field) for large and small washrooms, etc. Write to the Scott Washroom Advisory Service, Chester, Pa.

Trade Marks "ScotTissue," "Duralose," "Washroom Advisory Service," Reg. U. S. Pat. Off.

SCOTTISSUE TOWELS

Symbol of the right kind of washroom

THE RECORD REPORTS (*Continued from page 160*)

OLD HOUSE REOPENED

The Hammond-Harwood House in Annapolis, Md., owned and operated by the Hammond-Harwood House Assn., Inc., closed for some months for redecoration and refurnishing, is now open to the public again. One of the outstanding examples of Colonial American architecture of the second half of the 18th century in America, the house today looks much as it looked when built in 1770. A considerable amount of 18th century furniture has been acquired recently and new curtains for the entire house have been made, copied from old documents by Franco Scalamandre and designed by Mrs. Lounsberry.

CIVIL SERVICE ARCHITECTS

The San Francisco Civil Service Commission has announced a nation-wide examination for architects which will be administered at convenient places throughout the United States. The salary offered is $500 to $600 monthly.

Applications and examination bulletins may be obtained from the above-named commission, Room 151 City Hall, San Francisco, Calif. Applications must be received by April 16, and examinations will begin on May 17.

Zoology Laboratory, Municipal University, Omaha, Nebr.

Here's what "Kewaunee Equipped" Means to Architects . . .

The list of high school and elementary school laboratories that are "Kewaunee Equipped" reads like a Blue Book of the Educational Field.

Leading Architects know that with Kewaunee Engineers on the job at every stage, from planning to final inspection, no detail is overlooked.

Every completed Kewaunee job provides top efficiency with true economy and reflects credit on the architect who specifies "Kewaunee Equipment."

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AT THE COLLEGES

New Studytour Announced

Columbia University students of town planning and housing will take to the air next summer for a 10,000-mile studytour through South America and the Caribbean. Similar to last year's field trip through the United States, the 10-week summer session will be conducted by the Planning and Housing Division of the School of Architecture at Columbia, and is open to from 20 to 30 qualified students and professionals in the field. Director will be J. Marshall Miller, Associate Professor of Planning at Columbia.

For further information, address Professor Miller at 504 Avery, Columbia University, New York 27, N. Y. Applications must be approved by March 15 if reservations are to be assured.

Fellowships Available

Applications for fellowships, scholarships and assistantships for graduate study, research and teaching at Illinois Institute of Technology will be accepted until March 15, 1949, according to an announcement by Dr. W. A. Lewis, dean of the graduate school.

Fellowships are available in special fields of study — power systems engineering, gas technology and industrial research. Scholarships covering tuition are available for exceptional students.

Teaching assistantships are open in all departments, on both half-time and third-time bases.

Applications should be addressed to the Examiner of Credentials, Graduate School, Illinois Institute of Technology, Technology Center, Chicago 16.

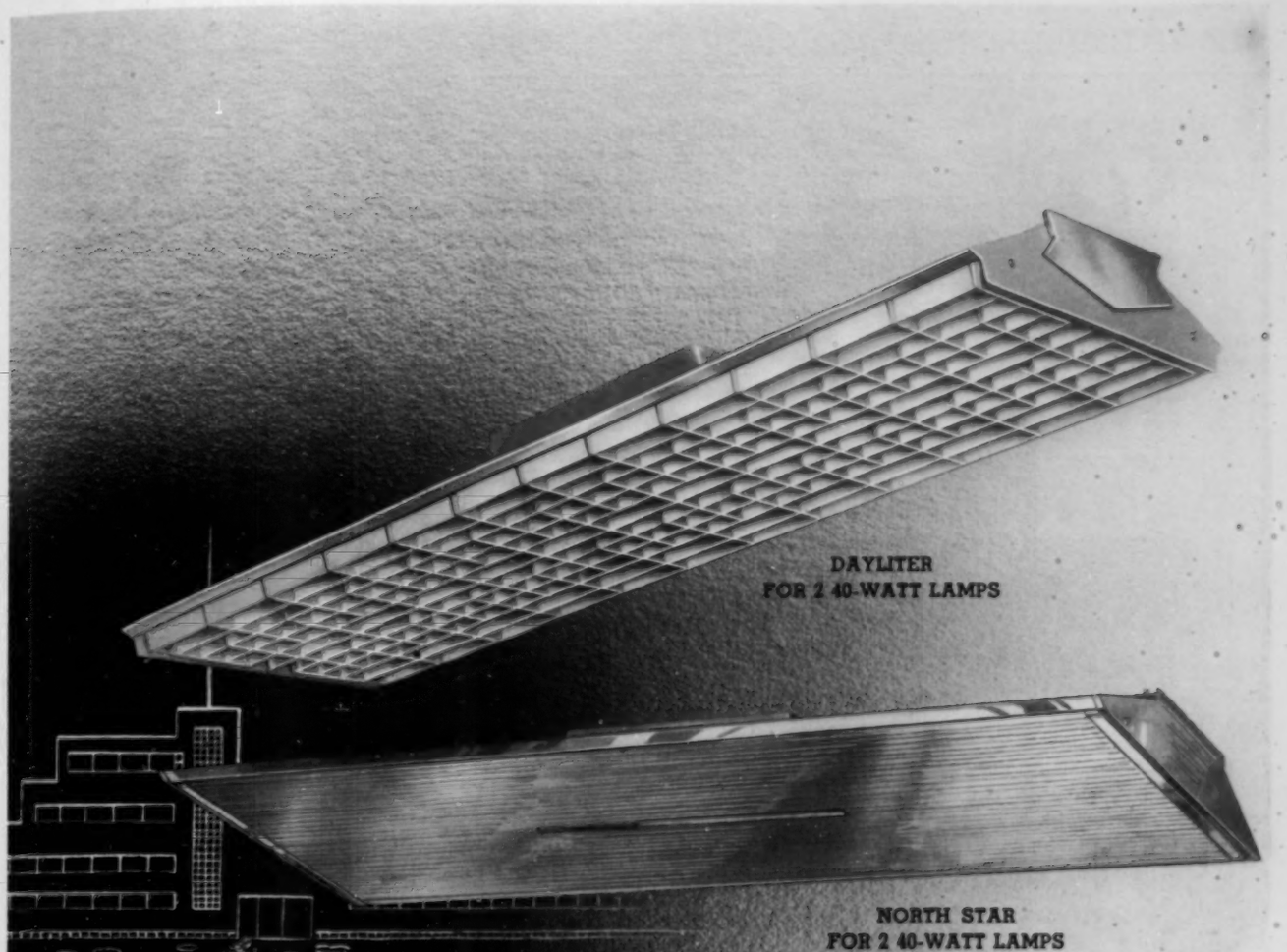
New Department at L.S.U.

A new department of Architectural Engineering will be in operation at the College of Engineering, Louisiana State University, next September, Dean Leo Jos. Lassalle of the College has announced. The department will be headed by O. J. Baker, A.I.A., graduate of the University of Illinois, and at present Director of Low-Cost Housing Research at Louisiana State.

Oklahoma Offers New Degree

The University of Oklahoma has announced a new curriculum in the Graduate College leading to a Master's degree in Regional and City Planning. The program is designed to meet the increasing demand in Oklahoma and the Southwest

(*Continued on page 164*)



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NORTH STAR

The use of carefully-designed reflectors behind the light source and controlling refractors in front of the light source give this shallow, attractive fixture a degree of light distribution that is unequalled by any comparable unit. The "impossible" light curve is proved by ETL data (available on request). A glass top and metal housing effectively keep dust from the two prismatic ribbed glass panels, which are completely framed and hinged to open easily. North Star may be surface mounted or hung on a graceful matching stem set, either singly or in continuous rows, with unusual simplicity. For handsome styling, an unprecedented degree of light in the working zone, and low surface brightness, specify Smithcraft's North Star.

by

FOR LOUVERED LIGHTING

DAYLITER

A shallow unit, modern in styling, with an exclusive louver pattern which provides excellent shielding and low surface brightness. The cut-off is extremely effective—40° crosswise, 30° lengthwise. The louvers are held by Smithcraft Duo-Cam Hangers (patent pending), which permit hinging from either side or complete removal without use of snaps, screws, or similar holding devices. The reflectors extend over the tops of the lamps to minimize dust accumulation. Dayliter may be installed individually or in continuous rows, surface or pendant. For high light output in the working zone and low surface brightness, specify Smithcraft's Dayliter.

Smithcraft
LIGHTING DIVISION
CHELSEA 50, MASSACHUSETTS

Complete technical data available on all Smithcraft Fluorescent Fixtures. Write today.

for professionally trained personnel in civic planning and leadership, and has been approved by the State Regents of Higher Education. It calls for not less than 54 credit hours of graduate study in architecture, civil engineering, sociology and government.

Yale Award to Markelius

Sven Markelius, internationally known Swedish architect and a member of the United Nations' Architectural Commission, has been chosen to receive Yale University's Howland Memorial Prize.

The Howland Medal is "awarded to the citizen of any country in recognition of some achievement of marked distinction in the field of literature or fine arts or the science of government." It was last presented in 1944 to Field Marshal Sir John Greer Dill, Chief of the British Joint Mission to the U. S.

Mr. Markelius is coming to this country this spring, and will serve as Visiting Critic in Advanced Architectural Design at Yale. The presentation of the Medal will take place at that time.

Research Project at Lehigh

A two-year research project aimed at checking and improving design procedures of shell roof structures has been assigned to the Fritz Engineering Laboratory of Lehigh University by the Roberts and Schaefer Engineering Co. of Chicago, Dr. Harvey A. Neville, Director of the University's Institute of Research, has announced.

Under the contract, experimental and analytical research will be conducted on the design of shell structures of reinforced concrete of the type used in large airplane hangars or in domes of monumental buildings. Dr. Bruce G. Johnston, director of the Fritz Laboratory, will supervise the project.

Dean Arnaud Honored

Leopold Arnaud, Dean of the School of Architecture of Columbia University since 1937, was inducted into the French Legion of Honor on December 10 in a private ceremony at the French Consulate in New York. The honor was conferred by Ludovic Chancel, Consul-General in New York, in behalf of the French government for Dean Arnaud's "championship of French methods of thought and education."

Tau Sigma Delta Recognized

Tau Sigma Delta, national honor society in Architecture and Allied Arts, has been admitted to the Association of College Honor Societies, reports Ernest H. Trysell, A.I.A., Grand Chapter Recorder of the Fraternity.

OFFICE NOTES

Offices Opened, Reopened

Alfred H. Abernethy, A.I.A., has announced the opening of his new office at East Market and Legion Streets, Johnson City, Tenn.

Paul James Huston, A.I.A., has opened a new office at 543 Bryant St., Palo Alto, Calif.

Bernard Kessler, R.A., has opened an office for the practice of architecture at Bennington College, Bennington, Vt.

John S. McDonald, Architect-Engineer, has opened a new office at 2438 Glenmore Ave., Dayton 9, Ohio.

Michael Saphier Associates, Industrial Designers, have opened new offices at 19 W. 44th St., New York 18.

New Addresses

The following new addresses have been announced:

John Kellam Associates New York Office (Thomas M. Schriber and Gordon T. Barlow), Room 826 Chrysler Bldg., 405 Lexington Ave., New York 17.

(*Continued on page 166*)

3 GYMS IN ONE

From Coast to Coast the HORN FOLDING BLEACHERS AND HORN FOLDING PARTITIONS are making one Gym do the job of three. With emphasis on careful planning Horn offers a "tested" solution to gym problems.

HORN FOLDING BLEACHERS-HORN FOLDING PARTITIONS

HORN, with years of experience and skill, offers to every school planner the services of the Horn Engineering Department. Horn installations are guaranteed.

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What's in the box? It's a box of heating comfort. A Trane Type A Convector-radiator. Quick relief for heating problems. Sure cure for cold floors and overheated ceilings.

These Active-Air Convectors give you an installation to be proud of. Not only in performance, but in appearance, too. They are designed so they can be streamlined into the wall line. None of that plumbing-in-the-living-room look.

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Cost less than cast iron to buy. Cost less to handle. They help cut overall cost of steam and hot water heating. When used on a hot water system with the Trane *high-head* circulator and regular Trane hot water specialties, a further saving can be made through the use of smaller pipe . . . A bonus in results without a bonus in price.

Remember this: You don't have to *explain* when you specify TRANE—it's the oldest name in Convector-radiators.

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Manufacturing Engineers of Heating, Ventilating and Air Conditioning Equipment—Unit Heaters, Convector-radiators, Heating and Cooling Coils, Fans, Compressors, Air Conditioners, Unit Ventilators, Special Heat Exchange Equipment, Steam and Hot Water Heating Specialties . . . IN CANADA, TRANE COMPANY OF CANADA, LTD., TORONTO.

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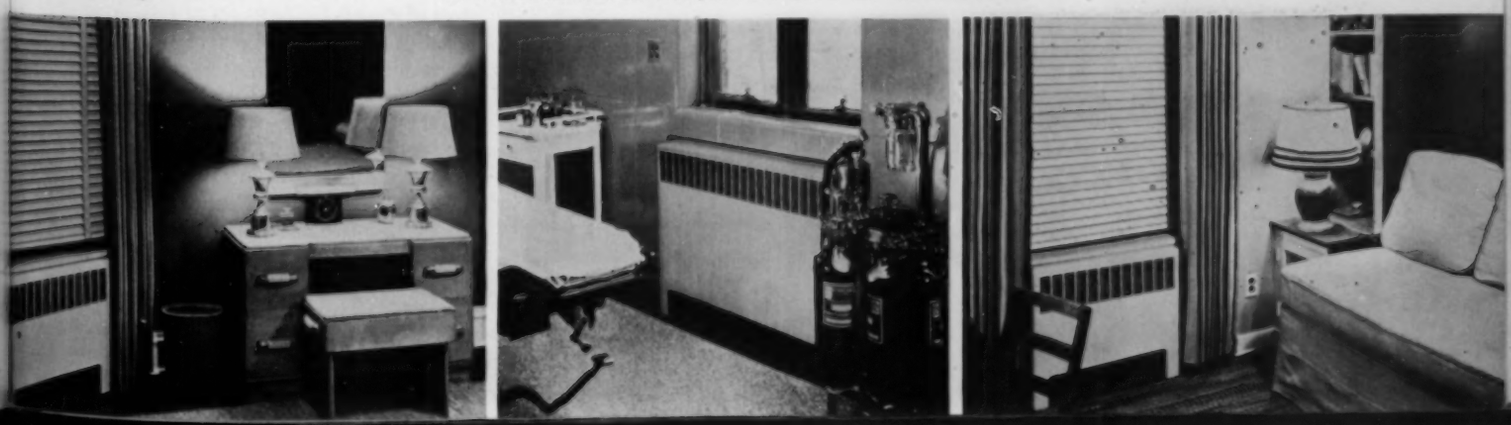


George Nelson, Designer, 20 W. 55th St., New York City.

Rink & Hoffman, Associates, Industrial Designing and Store Planning, 314 N. W. 23rd Ave., Portland 10, Ore.

Richard Boone Rogers, Architect, 14 E. Church St., Orlando, Fla.

New Firms, Firm Changes

A. M. Atkinson, A.I.A., Architect-Engineer, has announced the association of David G. Murray, Architect, with him in the practice of the profession of architecture under the firm name of Atkinson and Murray, with offices in the Thompson Bldg., Tulsa 3, Okla.

Paul W. Drake and Elmer S. Tuthill have announced the formation of the partnership of Drake and Tuthill Associates, Architects and Engineers, 100 Summit Ave., Summit, N. J.

The firm name of Michael Drazen and Associates has been changed to Drazen and Associates, Consulting Engineers, and offices have been moved to 8135 Forsythe Blvd., St. Louis 5, Mo.

Harrison Gill has announced that Harold E. Miller, A.I.A., and Chas. F. McKirahan have become associates in his practice and that the name of his firm has been changed to Harrison Gill & Associates, Architects. Address: Chattanooga Bank Bldg., Chattanooga, Tenn.

The firm of Kaelber and Waasdorp, Architects, will continue to conduct business in its present offices, Hiram Sibley Bldg., 311 Alexander St., Rochester 7, N. Y., under the direction of Leonard A. Waasdorp, A.I.A. William G. Kaelber, F.A.I.A., senior member of the firm, died on November 21st.

A new firm, RENDU, with offices at 400 N. 3rd St., Harrisburg, Pa., has been organized for the purpose of doing architectural delineation for architects. The firm, composed of free lance renderers, will deliver finished drawings within 15 days.

B. H. Whinston, Architect, has announced that his son, Bertram Lee Whinston, is now associated with him in the general practice of architecture under the firm name of Benjamin H. and Bert Lee Whinston, Architects, with offices at 465 Lexington Ave., New York 17. The younger Mr. Whinston is a graduate of Yale University School of Architecture, and holds a Master of Science in Architecture degree from Columbia University.

ELECTIONS, APPOINTMENTS

George Bain Cummings, of Binghamton, N. Y., has been elected to the Board of Directors of the American Institute of Architects by the members of the Board to fill the vacancy caused by the death on November 21st of William G. Kaelber of Rochester, N. Y. Mr. Cummings will serve as Regional Director for the New York District until the convention in March. He is a Fellow of the Institute, a graduate of the College of Architecture at Cornell University, and a member of the architectural firm of Conrad and Cummings of New York. From 1924 through 1926 he served as president of the Central New York Chapter, A.I.A., and since 1938 has been a member of the New York State Board of Examiners of Architects.

F. Ray Leimkuehler, Architect, and member of the firm of Maguolo and Quick, of St. Louis, has been appointed to the newly created post of Chief Architect of the St. Louis Board of Education. Twice president of the St. Louis Architectural Club, and a former national president of Scarab, honorary architectural fraternity, Mr. Leimkuehler is well known for his work in the school field.

Theodore H. Maenner of Omaha was installed as president of the National Association of Real Estate Boards at a banquet on January 11 in Washington.

Adaptable

TO ANY INTERIOR DESIGN

VERSATILE

Plain, Horizontaline, and Tile Patterns in a variety of sparkling colors, and in high gloss or velvet smooth finish. Wood and Marble Patterns in a variety of beautiful, authentic reproductions.

EASY TO SPECIFY

Width, 4 feet. Lengths, 4 to 12 feet. Thickness, 5/32 in. Complete line of aluminum alloy, presdwood, and plastic mouldings for all requirements.

NEW CONSTRUCTION OR MODERNIZATION

In any room, in any building, where colorful, practical interiors are needed . Marlite provides economical, permanently beautiful walls and ceilings.

Marlite PLASTIC-FINISHED
Wall and Ceiling Panels

Traditional or modern, conservative or boldly individual – regardless of the interior design – Marlite plastic-finished panels meet all the requirements for beautiful, economical walls and ceilings. Quickly and easily installed over old walls or new, Marlite is adaptable to any architectural treatment. Here is a deluxe material which keeps costs well within the most restricted budget. Complete details are available in Sweet's File, Architectural.

MARSH WALL PRODUCTS, INC.
205 MAIN STREET, DOVER, OHIO

for Creating Beautiful Interiors

Marsh Adhesives • Marsh Caulking • Marlite Polish
Marlite • Marsh Mouldings • Marsh Bathroom Accessories

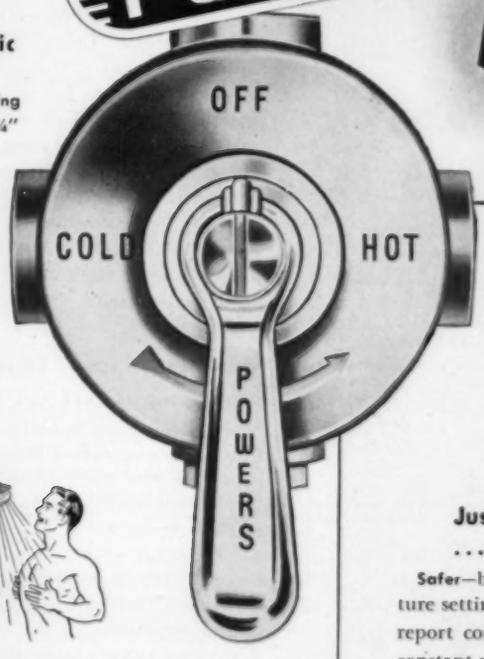
Bathers can really relax and enjoy a Powers regulated shower. No danger of scalding. No unexpected temperature changes

THE KEY TO SAFE SHOWERS

ONLY ONE MOVING PART—SIMPLICITY and durable construction insure many years of efficient carefree operation. Mixer body is made of bronze and parts subject to wear have a hard chromium finish.

POWERS

TYPE H Thermostatic MIXER
For exposed piping
Dial diameter 3¼"



For modern showers the Safety of Powers Mixers is indispensable

Safest for use by children, the aged or infirm.

Thermostatic SHOWER MIXERS

they are SAFE against scalding caused by

1 PRESSURE *or* 2 TEMPERATURE

fluctuations in water supply lines

Just what every shower user has always wanted! ... the perfect showers assured by POWERS mixers.

Safer—because of their quick acting response to any change in temperature setting, pressure or temperature variations in water supply lines. Users report control within ½°F. **Greater Comfort**—shower temperature remains constant wherever set. No jumpy temperatures. **More Economical**—POWERS thermostatic mixers promptly deliver showers at just the right temperature . . . no waste of time, hot and cold water.

For new installations or when modernizing obsolete showers . . . play safe, use Powers type H thermostatic shower mixers. May we send Circular H-48?

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NEWS FROM CANADA

By John Caulfield Smith

Dominion Government economists say Canada spent $3 billion on new capital investment in 1948, or 25 per cent more than in 1947. Much of it went into increased building costs and higher prices for machinery and other equipment. But about 10 per cent represents actual physical expansion on the part of the government, industries, institutions, farmers and house builders.

An investment record of this size is a phenomenal achievement for a nation having less than 13 million population. During the war years Canada invested $4.5 billion in plants and equipment, mostly in government funds. Yet in 1948 private business alone accounted for more than one-third of that amount. And indications are that there's still plenty of steam behind the country's economic growth!

Construction, always a barometer of confidence, reached a contract award total of nearly $1 billion. House building was particularly strong, despite prices about twice the prewar level. Residential contracts totaled nearly $400 million, compared with a little over $200 million for 1947. Commercial and institutional buildings accounted for contracts running well over $300 million, an increase of 25 per cent over 1947. Engineering works at $200 million were up 15 per cent, while factory construction registered the only decline. At less than $80 million, it was down one-third.

Stone Masons Now Air Borne

The Canadian construction industry is pinched by a shortage of skilled mechanics. It's estimated, for instance, that there are less than a hundred qualified stone masons in the country. None of these is free at present. However, the contractor for a new cut stone athletic building on the University of Western Ontario campus at London, hit upon an original solution to the problem. He simply flew the required number of masons over from Scotland!

Architects in Short Supply

Architects and engineers were in short supply during 1948, according to a report by Hon. Humphrey Mitchell, federal Minister of Labor. To some extent the employment gap was filled by university graduates, but openings for experienced technical personnel remained fairly constant at between 700 and 800. The number available varied from month to month at about 225. It is expected that the large graduating class of 1949 — estimated at approximately 3200, in all branches of engineering — will go far towards balancing the supply and demand situation.

Mr. Wright Spanks Education

In the opinion of Frank Lloyd Wright, North Americans have too much education for the good of true freedom. He expressed this view during a recent lecture sponsored by the Architectural Club of the University of Toronto.

"We want effects, but don't go into causes," Mr. Wright asserted. "We ourselves don't understand the true freedom of free enterprise or we wouldn't sell it down the river at the first scare." He noted that there was a lot of "whining" for security, "but the security and freedom which are required are protection for the individual to be himself."

Low Grade Lumber Prices Sag

While higher grades of lumber, or "clears," still sell at or close to previous prices, lower grades piling up in unsold stocks in sawmills and yards across the country are being offered at $5 to $15/M board feet than they commanded.

The Pacific Coast is more seriously affected than the East. United Kingdom

(*Continued on page 170*)

IS THIS A LOOK INTO THE FUTURE OF YOUR LABORATORY DRAIN LINE?

Cast iron soil pipe and fittings after three years of service in a chemical laboratory.

Here's a good example of what laboratory acids will do to an ordinary drain line.

You can avoid costly replacements by specifying Duriron for the laboratory drain lines in your new building. Duriron corrosion-proof pipe provides a permanent, non-leak installation for practically any corrosive.

Duriron can be hidden in walls or floor and forgotten. It will ordinarily serve as long as the building stands.

The corrosion-resistance of Duriron pipe is uniform through its entire wall thickness—there's no lining to chip, spall or crack. It is abrasion resistant. It will not warp or sag from heat.

For complete details write for Bulletin #703.

DURCO Adv. 82-GM

DURIRON ACID PROOF DRAIN PIPE

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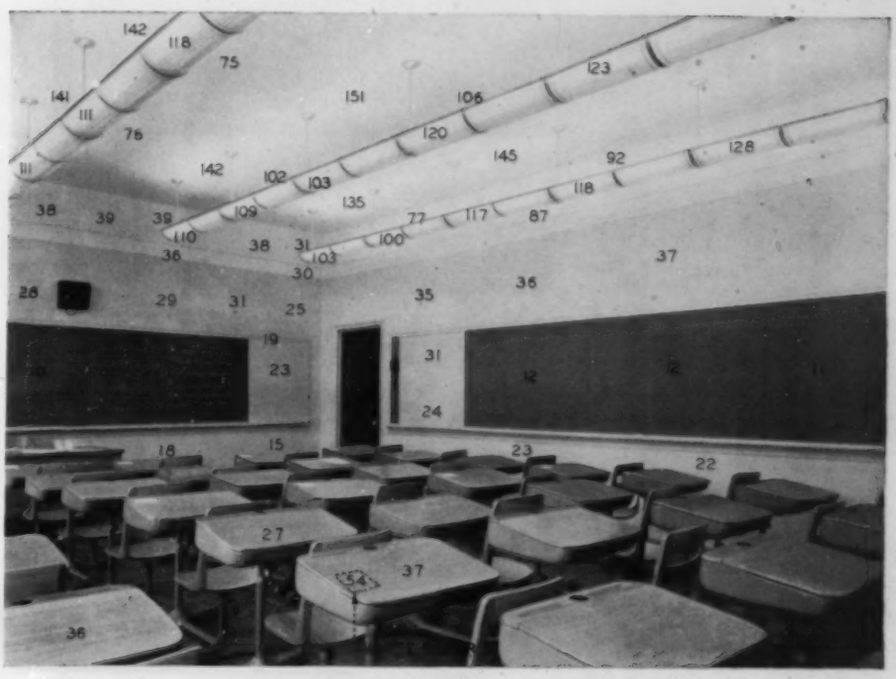
Now...A Classroom Lighting Installation Meeting or Bettering All Recommendations of *American Standard Practice*

An Engineering Report on Over-ALL Lighting by an Independent Consulting Illuminating Engineer.

Write for your copy.



This is undoubtedly one of the first classrooms to be measured against the recommendations of American Standard Practice for School Lighting, sponsored by I.E.S. and A.I.A., and approved September 20, 1948. This child-conditioned classroom in John Simpson Junior High School, Mansfield, Ohio, meets or betters all artificial lighting requirements of American Standard Practice, as well as (with the exception of the floor) those of the National Council on Schoolhouse Construction.

Description of Classroom: Room 101, John Simpson Junior High School, Mansfield, Ohio. 30 feet long, 22 feet wide, 12 feet high. Ceiling white. Walls yellow and turquoise. Natural finish seating. Light green chalkboards. Ivory tackboards. Double row of diffusion screens mounted at windows.

Lighting Installation: Four continuous rows of two-lamp, 40W Wakefield Star units with luminous indirect plastic reflectors using 3500° white fluorescent lamps.

Weather Conditions: The survey was made on November 26, 1948, seven months after installation. The day was dark and cloudy with sky brightness so low the brightness of the diffuser at the window was approximately the same as that of the wall adjacent to it (66 footlamberts).

A copy of the complete detailed engineering report is yours for the asking. It is interesting to note that all equipment and materials used in this classroom are regularly available from manufacturers' stocks, and we will be glad to supply manufacturers' names, catalog numbers and descriptions of materials on request. Write to The F. W. Wakefield Brass Company, Vermilion, Ohio.

Comparison of Brightness Ratios

	Room 101 John Simpson Junior High School	American Standard Practice for School Lighting	National Council on Schoolhouse Construction
Brightness of paper to brightness of desk top	1 to 1/1.6	1 to 1/3	1 to 1/5
Brightness of paper to brightness of floor	1 to 1/9	1 to 1/10	1 to 1/5
Brightness of paper to brightness of ceiling	1 to 2.78 (max.)	1 to 10	1 to 10
Brightness of luminaires to surfaces adjacent to them in the visual fields	3.4 to 1 (max.)	20 to 1	no recommendation
Brightness difference in the surrounding field between the brightest and darkest surfaces	18.5 to 1	no recommendation	50 to 1
Brightness difference in the peripheral field between the brightest and darkest surfaces	24 to 1	no recommendation	250 to 1
Lighting level	38 ft. c. lowest; 69 average	30 ft. c. min.	20 ft. c. min.

Comparison of Reflectances

Ceiling	Above 85%	80 to 85%	85%
Walls	62 to 70%	50 to 70%	50% min.
Trim	48%	30 to 40%	40 to 60%
Tackboards	67%	50 to 60%	no recom.
Chalkboards	24%	15 to 20%	30% max.
Desk Tops	30 to 55%	35 to 50%	30 to 40%
Floor	22%	15 to 30%	30 to 40%

Wakefield **Over-ALL Lighting**

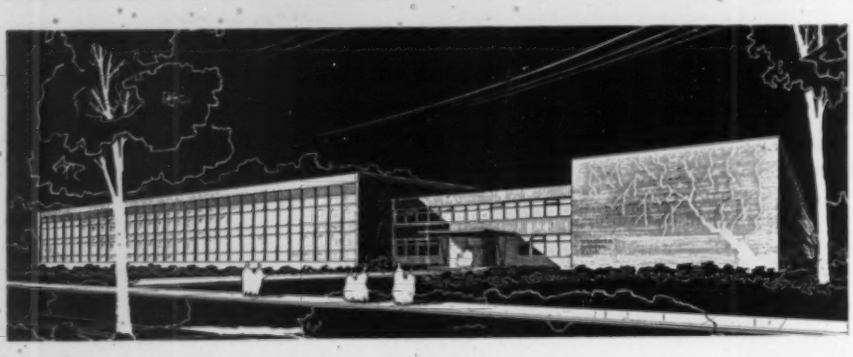
A BASIC CLASSROOM TOOL

THE GRENADIER II

THE COMMODORE

THE STAR

NEWS FROM CANADA (*Continued from page 168*)



Left: skating rink, pool, bowling alleys, badminton and squash courts, dining room and lounge will be provided by the new Winnipeg Winter Club, Winnipeg, Manitoba. Moody and Moore are the architects

orders recently placed in British Columbia are only half as big as hoped for and call for delivery of high quality lumber only. Since the province can sell all the "clears" it produces at home and in the United States, the British deal won't alter current prices for this commodity. But, as regards lower grades of lumber, British Columbia seems to be nearing a position of over-production. Some marginal mills in the interior of the province already have closed.

Houses Take Longer to Finish

The Dominion Bureau of Statistics reports that 58,402 dwelling units were completed in Canada in the first 10 months of 1948. During that time construction commenced on 78,553 units. The number under construction stood at 62,890 units at the end of October. For the first time since April, completions exceeded starts.

The average length of time required to build dwelling units completed in October was 6.1 months. This is a slight increase over the September figure of 5.4 months, and may be attributed to a shift in emphasis from starts to completions.

Graduates Average $205 a Month

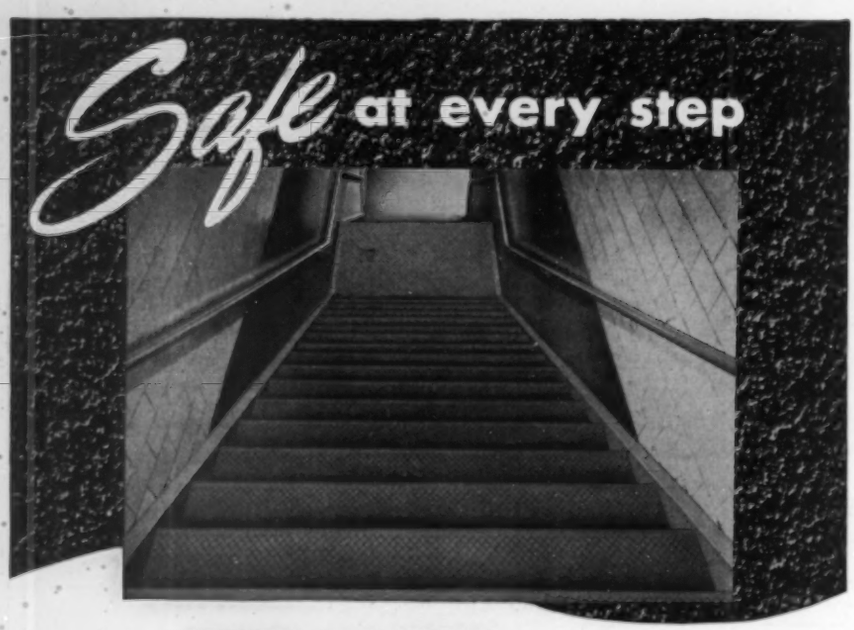
The 1948 crop of engineering and science graduates received an average starting salary of $205 per month, according to an announcement by Hon. Humphrey Mitchell, Minister of Labor. This sum compares with $200 for graduates of 1947, and $176 for those of '46. The figures were compiled by the Bureau of Technical Personnel from a case study of 1000 graduates with bachelor's degrees, involving about 150 employers. Initial salaries were concentrated in a fairly narrow range, with nearly 90 per cent of the graduates earning between $175 and $225 per month.

Service Lack May Hit Housing

How will housing fare in 1949? Canada entered the year with the largest carry-over of uncompleted dwelling units in its entire history — about 55,000. This implies that completions for 1949 will be high, since housing activity normally lags a year behind general business conditions. If there's any softening of the new house market it isn't likely to appear till 1950.

Housing's eye, however, has a cinder in it. At the end of the war many of our cities and towns had a surplus of serviced land. This has now been exhausted. Expansion of services proportionate to

(*Continued on page 188*)



WITH FERALUN SAFETY TREADS

Workmen at the Curtiss Wright Plant, Propeller Division, Caldwell, N. J., go up and down these stairs . . . safe at every step.

Their shoe soles come to grips with non-slip Feralun Safety Stair Treads, cast iron, with wear-resistant abrasive embedded right in the walking surface.

Heavy traffic day in, day out — — but Feralun Safety Treads, built to take hard use, stay non-slip . . . last and last.

And that means low maintenance . . . and high safety.

4 TYPES:

Cast iron base . . . . . FERALUN
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Aluminum base . . . ALUMALUN
Nickel bronze base . . NICALUN

3 SURFACE STYLES:

hatched . . . plain . . . fluted

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☐ Please send me your catalog on non-slip stair treads, floor plates, thresholds, elevator sills, and safety tile.

☐ Please have one of your safety engineers contact me.

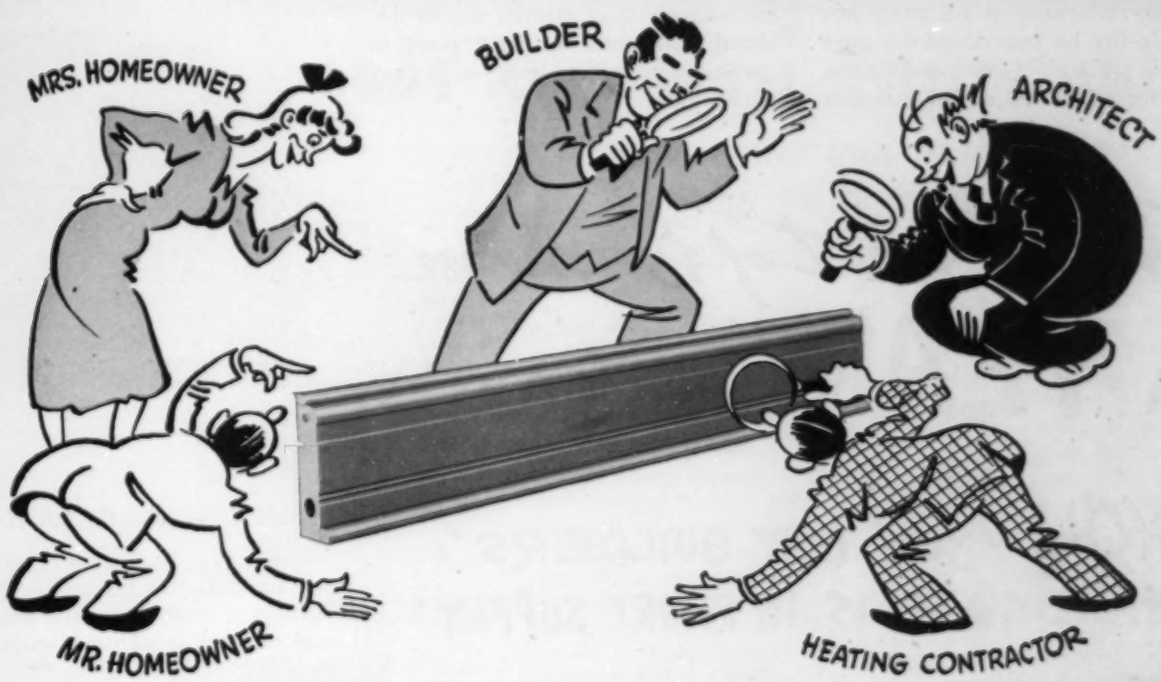
Name..... Title.....

Company.....

Street.....

City..... State.....

Why EVERYBODY'S looking into BASE-RAY—a practical approach to radiant panel heating



Remember, it was Burnham who *pioneered* the development of radiant baseboard panel heating. Burnham's BASE-RAY* Radiant Baseboards have now been on the market for nearly three years.

As time passes, Mr. & Mrs. Home Owner are going to be more and more frequently asking for your opinion of this sensational new method of radiant heating.

There are sound reasons why you can confidently recommend BASE-RAY Radiant Baseboards.

Our experience has given us ample opportunity to iron out the "bugs" which are usually present in any radically new product—and to work out installation procedures that time has proven are simple, practical and economical. Yes, Burnham's BASE-RAY Radiant Panels are an accepted and established product. They have already been installed in thousands of homes and have demonstrated their ability *in actual use* to live up to every claim we have made for them.

*Reg. U.S. Pat. Off.

BURNHAM BASE-RAY RADIANT BASEBOARD

Mail coupon below for Booklet which gives ratings and installation data on BASE-RAY Radiant Baseboards.

Burnham Corporation

"PIONEERS OF RADIANT BASEBOARD HEATING"

IRVINGTON, N. Y., Dept. AR 29

Burnham Corporation Dept. AR 29
Irvington, New York

Please send me copy of "Ratings and Installation Guide on BASE-RAY Radiant Baseboards."

Name.....

Address.....

City.....State.....

(*Continued from page 138*)

The Glasco contains a Tecumseh hermetic unit and its design allows for flush fitting with standard cabinets. J. H. Rasmussen and Company, 1454 Merchandise Mart, Chicago 54, Ill.

CABINETS FOR BLUEPRINTS

A new filing cabinet for blueprints, *Draw-In-Dex*, has been designed to meet the twin problems of safety and accessibility for prints and similar materials such as photostats, charts and photo blowups.

With space for 1000 prints, and an index for quick location of any item, the cabinet is 4 ft. high, 2½ ft. wide and 20 in. deep. Drawings are attached to manila hangers on suspension rods which, the manufacturers explain, are so designed that when the front panel is opened any drawing may be immediately filed or removed.

Draw-In-Dex has an 18-gauge steel top and 16-gauge reinforced steel sides and comes in grey, green and (mahogany) brown. Empire Development Corp., 52 Broadway, New York 4, N. Y.

Filing cabinet holds, indexes 1000 prints

MODEL BUILDINGS OF LUCITE

Models of single and multi-story structures are now being made of clear lucite at ¼ in. scale to enable architects, engineers and layout men to study building and planning problems.

The models are built following exact print dimensions to scale and have engraved scale grid floors. Models of any type of commercial or industrial building are complete with all columns, stairwells, elevator shafts and other building characteristics. Outside walls are indicated with white lucite. Visual Planning Equipment Co., Inc., Pennsylvania Ave. at River, Oakmont, Pa.

HOME FIRE EXTINGUISHER

Especially designed to combat flammable liquid fires and electrical fires, a new portable low-cost fire extinguisher has been developed for home protection.

Fyre-Freez, which weighs less than five pounds, consists of a slim steel cylinder containing carbon dioxide under pressure, and is equipped with an insulated nozzle at one end. A turn of the nozzle releases carbon dioxide in the form of a cloud of dry ice snow which dilutes the oxygen content of the air around the fire and smothers the blaze before it can spread.

Intended for use against home fires starting in kitchens, basements, garages and workshops, the extinguisher is installed in a simple wall bracket, and the

(*Continued on page 174*)

For the want of hardware
A YEAR WAS LOST
YOU KNOW THAT BUILDERS' HARDWARE IS IN SHORT SUPPLY
BUT —
Ellison, the BALANCED DOOR brings all operating and other hardware on the job WHEN YOU WANT IT THERE!
AND —
Ellison IS THE DOOR THAT LETS TRAFFIC THROUGH QUICKLY

Ellison
ELLISON BRONZE CO.
Jamestown, New York
representatives in principal cities
the BALANCED DOOR

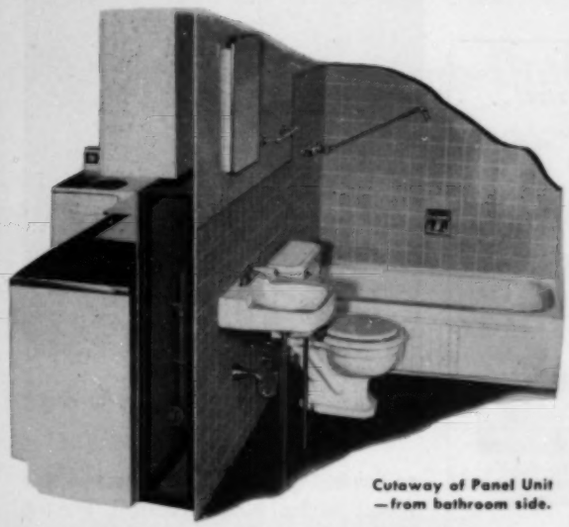
NO. 2 OF A SERIES

The PROFESSIONAL BUILDERS' BULLETIN

An "Idea Department" from the Engineers of Ingersoll

BW PRODUCT OF BORG-WARNER

INGERSOLL ADDS NEW MODEL UTILITY UNIT



Cutaway of Panel Unit —from bathroom side.

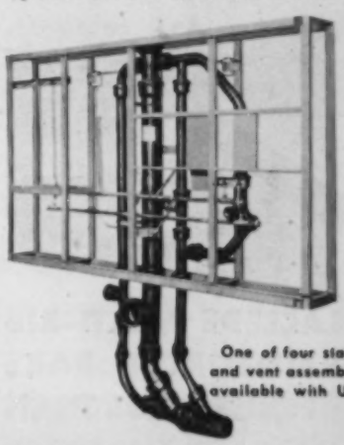
Simplified Panel Unit Includes All Basic Plumbing in Minimum Space—

HEATING UNIT MAY BE PURCHASED SEPARATELY!

A new, simplified Utility Unit has been added to the Ingersoll line. It includes all basic plumbing plus a complete kitchen and bath. Unlike the standard Unit, the heating plant is not an integral part of the new model. The new Ingersoll "88" or other furnaces may be purchased separately if desired.

This unit is built around a compact, 10-inch-wide panel core. To meet your codes there is a choice of four vent and stack assemblies. Further flexibility is provided in a choice of lead, cast iron and steel materials in vents, stacks, wastes and undergrounds.

Assembled by skilled A. F. of L. Building Trade Mechanics, the new Panel Unit combines the economies of pre-engineered assembly with the flexibility of buying small-home utilities in individual components. It is equally adaptable to homes with or without basements, to multi-storied apartments and to tourist courts.

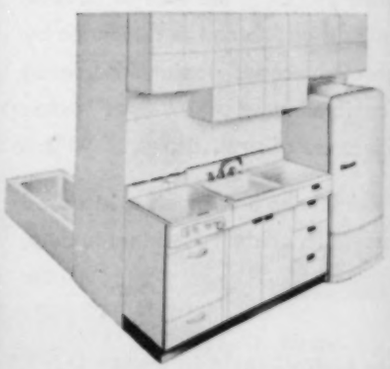


One of four stack and vent assemblies available with Unit.

"JUST WHAT WE'VE NEEDED" TRADE SAYS ABOUT NEW INGERSOLL "88" FURNACE

Enthusiastic acceptance everywhere has greeted the recently introduced Ingersoll "88" Furnace. Gas-fired, it has an output of 50,000 B.T.U.s, yet occupies less than 3 square feet of floor space. It has been approved by A.G.A. for installation within walls—an interliner jacket keeps the exterior cool. It is equally efficient either as a space heater or for duct-type heat distribution.

New Wholesalers Report on Sales of Ingersoll Utility Unit



Reports from the more than 100 wholesalers added by Ingersoll in recent months, indicate excellent sales activity for the Ingersoll Unit. "The Unit fills a real need," is the the most frequent explanation.

WRITE FOR INGERSOLL BOOKLET TODAY

It's yours for the asking, at no cost to you—a complete booklet about the new Ingersoll Panel Utility Unit and "88" Furnace. Gives all information complete with illustrations, diagrams and suggested floor plans.

Write for yours today!

INGERSOLL UTILITY UNIT DIVISION
Borg-Warner Corporation
Dept. M2, 321 Plymouth Court
Chicago 4, Illinois

(*Continued from page 172*)

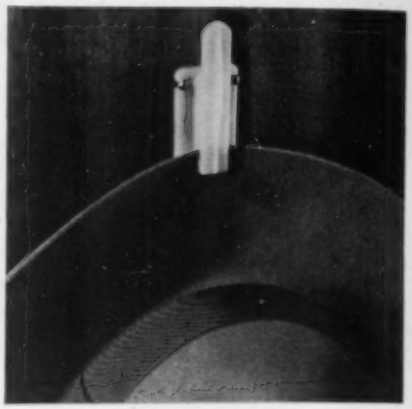
manufacturers report that it can be handled easily by the housewife without special training or complicated directions. Walter Kidde & Co., 40 E. 34th St., New York 16, N. Y.

GAS WATER HEATERS

Norge has introduced two new automatic gas water heaters for natural, manufactured and L.P. gases which feature drilled, raised-port burners; blanket-type Fiberglas insulation; heavy-duty (300 lb. test) tank; spiral baffled internal flue; dial temperature control; safety shut-off; and concealed hot and cold water connections. The manufacturer reports that rapid heat transfer and maximum recovery are achieved with the burner located in the center of the base and the internal flue off-center in the tank. Each model is available in 20-, 30-, 45- and 66-gal. sizes. Norge Heat Div., Borg-Warner Corp., 672 E. Woodbridge, Detroit 26, Mich.

PLASTIC HANGER

A small inconspicuous hanger of *Tenite* plastic for hats or handbags is designed for church pews, theater seats, restaurant chairs, and bus and airplane seats. It consists of two stationary, but resilient, prongs grooved to accommodate the brim of a hat. Tenite is said to have sufficient "give" and toughness so that no mechanical hinge is needed. The top of the pronged section extends upward and forms a hook for the handle of a purse or umbrella.



Small plastic hanger holds hats, handbags

The holder is installed on the seat back by means of small screws which slide into slots molded in the plastic. Plastic Process Ass'n., 3700 Euclid Ave., Cleveland 15, Ohio.

DUMB WAITER DOORS

Dumb Waiter Doors of steel for use with electric or hand power dumb waiters or for protecting the landing opening of conveyors, chutes and other types of floor-to-floor transportation systems are being manufactured by the Sedgwick Machine Works.

The doors come in four general types — bi-parting, slide-up, slide-down and hinged. Doors and frames are completely factory assembled units. Sedgwick Machine Works, 142 W. 15th St., New York 11, N. Y.

LUCITE WASHBASIN

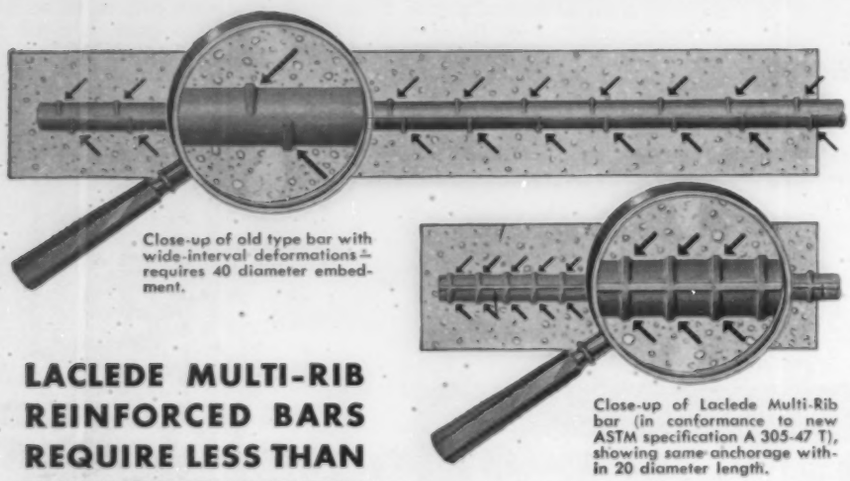
Washbasins are now being made from heat resistant Dupont *Lucite* for use in small housing projects, summer cottages, trailers, boats, trains, etc.

This new basin is said to be stainless, chipless and comes in white, pink, blue and green. The over-all size is 14¼ in.

(*Continued on page 176*)

The third of a series in the interest of more efficient use of steel... a vital American resource.

SAME ANCHORAGE... only ½ the STEEL!



Close-up of old type bar with wide-interval deformations requires 40 diameter embedment.

Close-up of Laclede Multi-Rib bar (in conformance to new ASTM specification A 305-47 T), showing same anchorage within 20 diameter length.

LACLEDE MULTI-RIB REINFORCED BARS REQUIRE LESS THAN HALF THE EMBEDDED LENGTH...

When the strength is there (in excess of 55,000 psi) as in the case of Laclede Multi-Ribbed Reinforcing Bars, why waste steel and add to cost and tonnage by specifying unnecessary bar embedment through codes rapidly becoming obsolete? By demanding reinforcing steel conforming to ASTM Specification A 305-47 T you can benefit from a more efficient use of steel.

The balanced design of the Laclede Multi-Rib Reinforcing Bar combines improved anchorage with high yield strength steel to assure its efficient use in up-to-date, economical construction.

Your specifications should include the ASTM A305-47T *requirement for reinforcing steel.*

LACLEDE
Producers of Construction Steel

LACLEDE STEEL COMPANY
St. Louis, Mo.

The New Kno-Draft Ceiling Smudge Control

Now you can control tough smudging problems. When exceptionally sooty, smoky or dusty air conditions are expected, or where rough textured, dirt-catching ceilings are employed, Kno-Draft Anti-Smudge Cones give the utmost in protection—and increase the attractiveness of the diffuser besides.

How it works

Under normal conditions, all Kno-Draft diffusers can be adjusted so that their specially designed deep shoulder rims will deflect the discharge air away from the ceilings and prevent smudging. However, under the abnormal conditions mentioned above, the use of Kno-Draft anti-smudge cones is recommended. They furnish the additional control which will enable you to provide the precise minimum separation of the discharge air from the ceiling that you need to inhibit smudging and, at the same time, maintain the radial air diffusion pattern you need to eliminate drafts.

What we can do to help

W. B. Connor Engineering Corp. maintains a research laboratory with a staff of trained specialists and district representatives in leading cities. Their services are at the disposal of consulting engineers, architects, air conditioning dealers, and plant engineers. They can assist you in getting the best possible performance out of your air conditioning system by creating custom-made air patterns which thoroughly mix room and supply air, eliminate drafts, and maintain uniform temperature throughout an area.

W. B. CONNOR ENGINEERING CORP.

Air Diffusion • Air Purification • Air Recovery

112 East 32nd Street — CONNOR — New York 16, N. Y.

IN CANADA: Douglas Engineering Co., Ltd., 190 Murray Street, Montreal 3, P. Q.

FREE HELPFUL LITERATURE

☐ BULLETIN K-22—Contains complete details on the new and exclusive Kno-Draft Anti-Smudge Cone.

☐ NEW HANDBOOK ON AIR DIFFUSION — Contains all the engineering data necessary on air diffusion in general and Kno-Draft Adjustable Diffusers in particular to enable you to create "custom-made" air patterns and eliminate drafts.

W. B. Connor Engineering Corp.
Dept. S-110, 112 East 32nd Street
New York 16, New York

Please send me the free literature I have checked above.

Name.....

Company.....

Street.....

City..... Zone.... State.....

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 174*)

long by 15 in. wide, and the weight is 21 lb.

The basins can be designed to meet individual specifications or designs. Faucets and drains are supplied if desired. Durable Formed Products, Inc., 6 Greene St., New York, N. Y.

TRAFFIC PAINT FOR CONCRETE

Concrete traffic paint, claimed to be both long-wearing and quick-drying, has been developed particularly for marking factory aisle border lines; pull-out and storage areas; danger zones; and warning symbols at blind corners, entrances to passageways, etc.

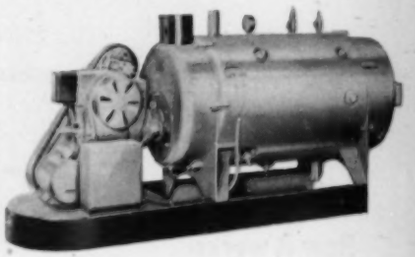
The new paint is said to dry in about five minutes at 75° F. or over and can be sprayed on with conventional marking equipment. The *Oncrete* paint is immediately available in Federal Yellow, Traffic White and Traffic Black. Other colors can be developed on request, according to the manufacturer. Lowebco, Inc., 1525 E. 53rd St., Chicago 15, Ill.

HOT WATER BOILER

Described as ideal for panel, gravity or forced feed hot water applications is a new boiler being marketed by Cleaver-Brooks Co.

The automatic boiler is designed to be fired by either oil or gas and is available in three sizes, 250,000, 550,000 and 730,000 Btu output.

Four-pass construction of the boiler shell is said to insure high rating and efficiency. The boilers are reported to have a minimum design pressure of 100 psi and are suitable for high temperature or pressure installations.



Oil- or gas-fired boiler is designed for panel, gravity or forced feed heating

A hinged rear door lined with refractory material is designed to provide easy accessibility for cleaning and maintenance. Exhaust gas is vented through a chimney.

The boiler is 113 in. long, 44 in. high and 26½ in. wide. Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.

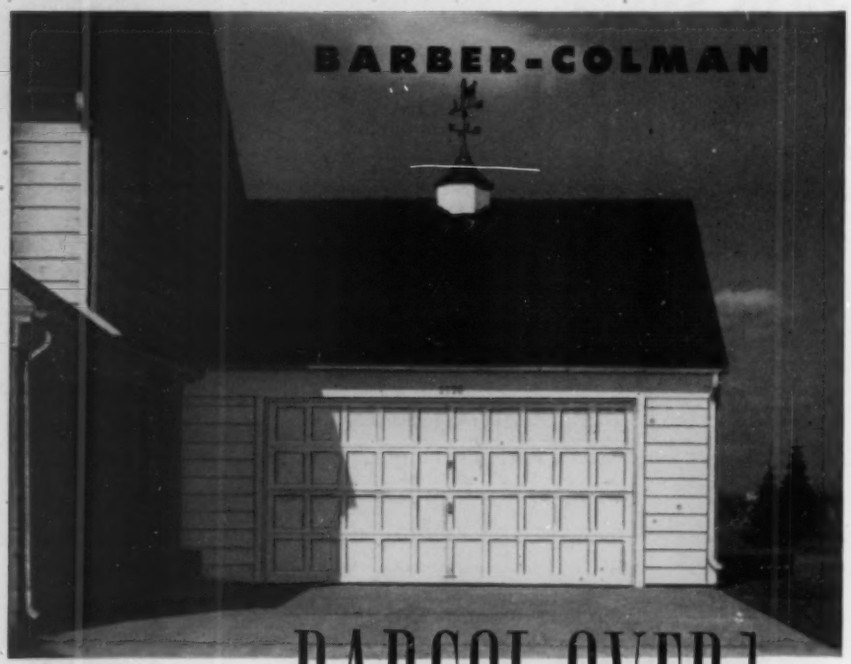
Rubber matting made in sponge-like form

SPONGE RUBBER MATTING

Industrial rubber matting is now being manufactured from Neoprene in a "sponge-rubber-like" form (containing nitrogen filled bubbles) which is said to provide a more restful cushioning effect.

Triangular raised "feet" on both sides

(*Continued on page 178*)



THE CHOICE OF BUYERS WHO INVESTIGATE BEFORE THEY BUY

BARCOL OVERdoor

WEATHERTIGHT. Special roller crank closing action moves the entire door smoothly and evenly against the stop strips in the last few inches of its downward travel, effectively sealing the opening against dust, dirt, litter, snow, rain, sleet, and wind.

EASY WORKING. Tailored twin-torsion counterbalancing springs accurately support the weight of the door, so minimum effort is required for raising or lowering. Sticking is eliminated by the fast-freeing effect of the closing action.

DURABLE. Barcol OVERdoors give long, trouble-free service because of strong construction, accurate assembly, and good installation by factory-trained men.

SEE OUR CATALOG IN SWEET'S

DOUBLE-WIDTH FEATURES. Above we show a double-width Barcol OVERdoor as used on a modern two-car garage. The use of wider single doors like this reduces the cost of installation, reduces the mechanism, eliminates the center post, gives more room for maneuvering two cars, and reduces the chances of damaging cars or garage by collision. These advantages are worth considering for every two-car garage door installation, whether new or remodeling.

ELECTRIC OPERATION. Barcol Electric Door Operators are available for swinging, sliding, and overhead type doors, and for sliding gates. They offer the convenience and protection of switch control or the amazing Radio Control.

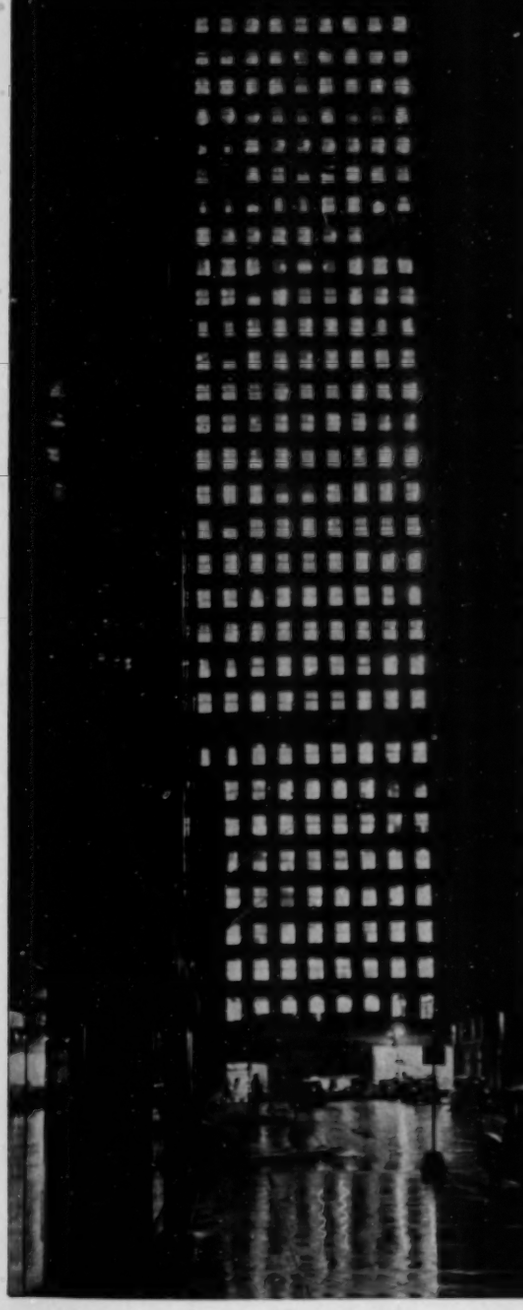
FACTORY-TRAINED SALES and SERVICE REPRESENTATIVES in PRINCIPAL CITIES

BARCOL

BARBER-COLMAN COMPANY

102 MILL ST. • ROCKFORD, ILLINOIS

WHY A WELL PLANNED LIGHTING INSTALLATION NEEDS CORNING ALBA-LITE



Well planned fluorescent lighting results not only from the design and location of fixtures but also from the proper use of lighting glassware. Corning ALBA-LITE deserves special recognition for its qualities of diffusion and brightness control.

It diffusely transmits 60 to 65% of the light and diffusely reflects 25 to 35%, making its efficiency greater than 90% (the sum of reflection and transmission). This combined with even transmission and low panel brightness makes it adaptable to almost any type of fluorescent installation.

All these qualities are contained in a thin glass panel which permits shallow fixture construction, whether in fixtures or in complete ceilings. Cleaned easily, ALBA-LITE does not retain finger prints and resists weathering. It will not warp, discolor or scratch, regardless of the length of time in use. Add this to sound lighting qualities and you get efficient lighting performance.

Bulletin LS-17, now available, describes how ALBA-LITE is used for direct, semi-direct, semi-indirect lighting and completely luminous ceilings. It also covers Corning's complete line of Engineered Lightingware. You should have a copy if lighting is one of your responsibilities.

ALBA-LITE is used on almost every floor of the Esso Building, New York City; Architects: Carson & Lundin; Lighting Engineers: Pollak & Grieve; Fixture Manufacturer: Caldwell & Co., all of New York City.

CORNING means research in GLASS

PYREX T.M. REG. U.S. PAT. OFF.

CORNING GLASS WORKS, DEPT. AR2, CORNING, N. Y.

Please send me your Data Book LS-17, "Corning Engineered Lightingware," describing MONA-LITE, ALBA-LITE and other Corning products.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 176*)

of the mat provide non-slip foot traction. The *Neo-Sponge Comfort Matting* is described as being both an electrical and a thermal insulator, and having resistance to deterioration by greases, fats, oils, heat or acids.

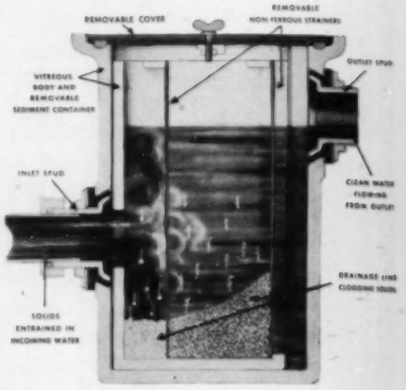
The matting comes in standard widths of 18 and 36 in., in thicknesses of ¼ and ⅜ in., and in lengths up to 9 ft. 6 in. American Floor Products Co., 1526 N St., N. W., Washington, D. C.

BURGLAR ALARM

Increased protection is provided in a new low-cost burglar alarm through application of a modulated light beam which is invisible to the naked eye.

The alarm is operated by a change in the "light level of the pre-set modulated frequency"; in this way it is said to be unaffected by surrounding light.

The manufacturer claims effective operation up to 250 ft. and says that the light beam can be directed around corners or criss-crossed to protect large areas economically. The alarm is said to be easily installed and requires no electrical adjustments. Ripley Co., Inc., Middletown, Conn.



Solids interceptor features easy cleaning

SOLIDS INTERCEPTOR

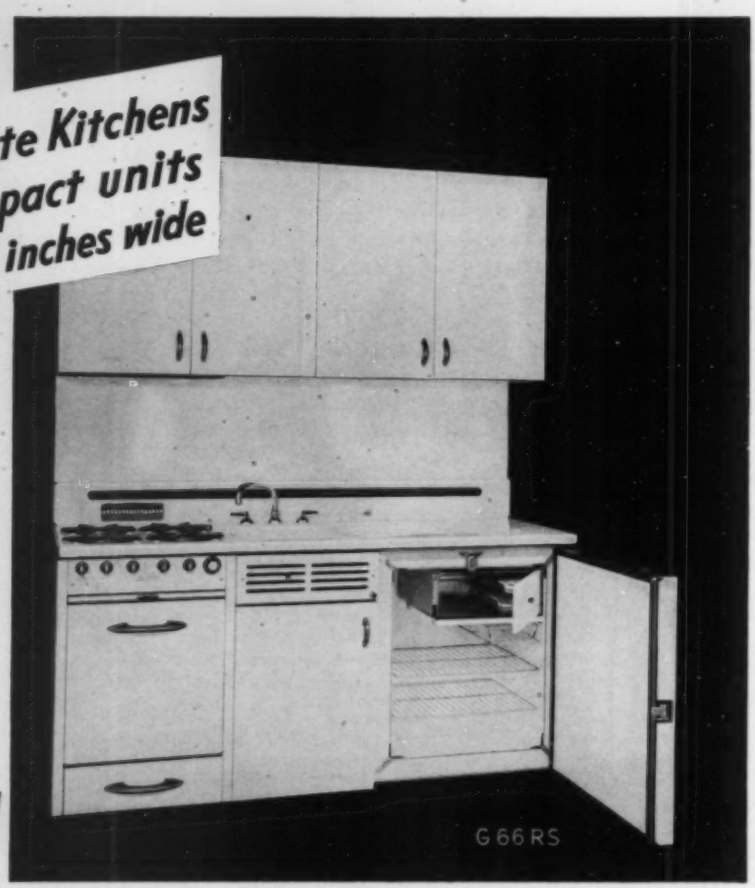
Quick and easy cleaning is listed by the manufacturer as one of the features of a new solids interceptor designed to prevent fragments of solids in waste water from flowing into building drainage lines.

A single motion brings the sediment container out for cleaning after the nonmetallic cover is removed by unlocking a clamp, according to reports.

Two perforated metal strainers intercept the solids in the waste water as it passes through the interceptor body, and serve, in addition, as baffles to calm the water so solids drop more readily to the bottom of the sediment container. J. A. Zurn Mfg. Co., Erie, Pa.

SCHOOLROOM LIGHTING FIXTURE

Designed specifically for schoolroom use, the *Spill-Lite* is reported made of virtually unbreakable tempered glass and designed for balanced illumination, easy cleaning and maintenance. Spill-Lite uses one 300 or 500 watt bulb which can be changed from the floor without removing the lighting bowl. The fixture is a silvered bowl unit 20 in. long and 21 in. wide, finished in satin chrome. It has a swivel type of rod suspension and is provided with a patented spillway to expel dirt, bugs and debris. The manufacturer claims an efficiency performance 10 per cent better than conventional units. It is said to furnish glareless, shadowless illumination. Appleman Art Glass Works, Bergenfield, N. J.



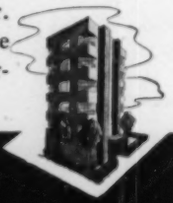
Complete Kitchens in compact units 39 to 66 inches wide

Ready to install

MURPHY - CABRANETTE KITCHENS

in the permanent beauty of porcelain on steel.

Gas or electric range of approved design, electric refrigerator with push-button door and stainless steel frozen food compartment, one-piece sink and range top, storage cases . . . streamlined in one compact unit. Vitreous porcelain on exposed surfaces never requires painting; washes clean with soap and water. Trouble-free operation and negligible maintenance costs proven in 25 years of service in rental properties. Write for new bulletins.

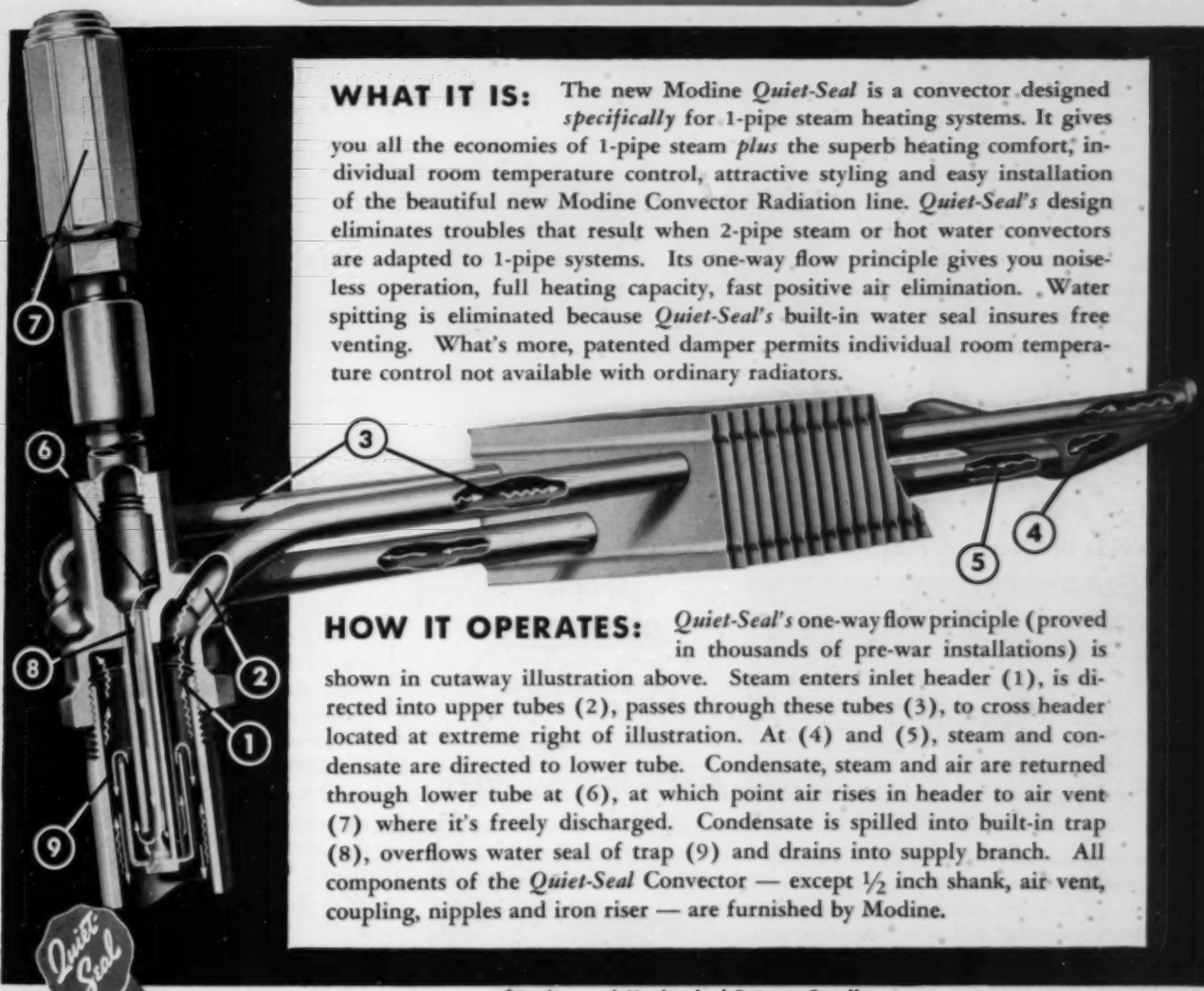


DWYER PRODUCTS CORPORATION
Dept. A2 — MICHIGAN CITY, INDIANA

NOW..A NEW *Modine* CONVECTOR

Designed Specifically For 1-Pipe Steam Systems

the New QUIET-SEAL*



WHAT IT IS: The new Modine *Quiet-Seal* is a convector designed *specifically* for 1-pipe steam heating systems. It gives you all the economies of 1-pipe steam *plus* the superb heating comfort, individual room temperature control, attractive styling and easy installation of the beautiful new Modine Convector Radiation line. *Quiet-Seal's* design eliminates troubles that result when 2-pipe steam or hot water convectors are adapted to 1-pipe systems. Its one-way flow principle gives you noiseless operation, full heating capacity, fast positive air elimination. Water spitting is eliminated because *Quiet-Seal's* built-in water seal insures free venting. What's more, patented damper permits individual room temperature control not available with ordinary radiators.

HOW IT OPERATES: *Quiet-Seal's* one-way flow principle (proved in thousands of pre-war installations) is shown in cutaway illustration above. Steam enters inlet header (1), is directed into upper tubes (2), passes through these tubes (3), to cross header located at extreme right of illustration. At (4) and (5), steam and condensate are directed to lower tube. Condensate, steam and air are returned through lower tube at (6), at which point air rises in header to air vent (7) where it's freely discharged. Condensate is spilled into built-in trap (8), overflows water seal of trap (9) and drains into supply branch. All components of the *Quiet-Seal* Convector — except ½ inch shank, air vent, coupling, nipples and iron riser — are furnished by Modine.

Quiet Seal

Trade Mark Pending

***Design and Mechanical Patents Pending**

New Beauty . . . Easier Installation . . . Simpler Maintenance mark the New Modine Convector. Functionally styled to complement modern taste, it gives you these outstanding features: (1) Dual-Purpose Damper, (2) Convenient Air Venting, (3) 5-Second Removable Front, (4) Snap-in Lower Grille (optional), (5) Simplified Recessing. For all the facts, on the new Quiet-Seal 1-pipe convector, see your Modine Representative. He's listed in the "Where-to-Buy-It" section of your phone book. Or send in coupon at right.

Modine

Quiet-Seal CONVECTORS

MODINE MANUFACTURING CO.
1510 Dekoven Avenue, Racine, Wisconsin

Gentlemen: Yes! I want the new bulletin describing the New Modine Quiet-Seal Convector for 1-pipe steam systems.

NAME.....

ADDRESS.....

CITY.....STATE.....

MANUFACTURERS' LITERATURE

Wire Fence

Realock Fences (Catalog No. F-901). A complete line of wire fence and gates for various degrees of protection is described and illustrated in this bulletin. The different types of fence have been classified and thumb-indexed according to usage.

Besides covering such typical applications as fences for residences, parks, swimming pools and industrial plants, the bulletin contains information on tennis court enclosures and baseball backstops.

Each fence type is illustrated and general specifications are included on the fabric, terminal posts, pipe and post setting. Weights and dimensions of fence components are also given. 48 pp., illus. The Colorado Fuel and Iron Corp., Wickwire Spencer Steel Division, 361 Delaware Ave., Buffalo 2, N. Y.*

Asphalt Tile Flooring

Floors That Endure. Color photographs show floor design ideas for stores and offices, institutions, public areas and homes. Available colors, both plain and marbelized, are illustrated. Detail drawings show how connecting strips (to join tile of different thicknesses), cove bases and reducing strips (used as edging) are installed. 16 pp., illus. The Tile-Tex Co., Inc., 1232 McKinley Ave., Chicago Heights, Ill.*

Aluminum Architectural Shapes

Reynolds Extruded Aluminum Architectural Shapes. Portfolio of detailed drawings covering Reynolds present line of standard aluminum architectural shapes. Cross sections are all printed solid black in actual size.

An index in the front makes it easy for the draftsman to select the particular shape he wants for making up detail drawings.

Assembly drawings show how the various sections are combined for building up windows, copings, etc. Illustrations also show how the architectural shapes are joined to other members of the structure.

Additional reference information of value to architects and engineers is the size and weight data on aluminum rods and bars as well as standard structural shapes. Reynolds Metals Co., Desk 4220, 2500 So. Third St., Louisville 1, Ky.*

Rubber Floor Tile

New Horizons in Floor Design. Booklet shows 54 different floor designs possible with the new *Wavedge* rubber tile. It includes border and field patterns, centerpieces, repeat units and special design effects. This is made possible by the rubber tile being cut along a diagonal double curve.

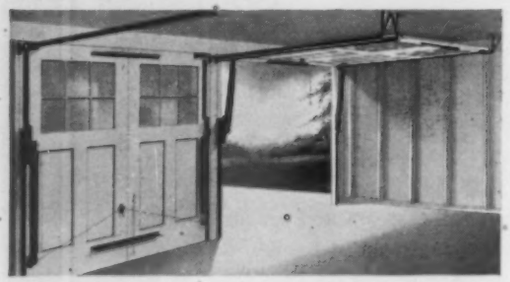
A section in the back of the book provides installation and technical information. A list of suggested applications for the designs illustrated is also furnished. 64 pp., illus. The Danbury Rubber Co., Inc., Danbury, Conn.*

(*Continued on page 182*)

* *Other product information in Sweet's File, 1949*

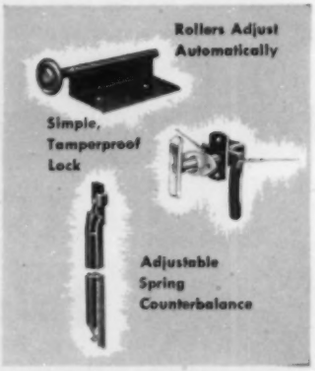
EASY...
EVEN FOR A CHILD!

To Provide the Newest, Most Modern Overhead Door Convenience
Specify
Richards-Wilcox nine ninety nine 999
GARAGE DOOR HARDWARE



Ordinary obstacles, and seasonal "headaches" such as slush, snow, and freezing temperatures are nothing to worry about when garage doors have been converted to the *overhead* door convenience made possible by Richards-Wilcox Garage Door Hardware. And with the new R-W nine-ninety-nine line the conversion process is swift, easy, economical. Everything needed for installation and operation, all hardware including tracks, comes complete in one carton. Requires only ½" headroom.

For modernization, or in planning new structures, specify overhead garage doors with R-W 999 Hardware, and be sure of doors that will function smoothly, quietly, effortlessly—so easy even a child can operate them. For further information about R-W 999 Garage Door Hardware, call the nearest Richards-Wilcox office, or write for free folder.



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. . . and at famous Parkchester —
FABRON Wall Coverings minimize maintenance . . . beautify for years

As THE originator of the large scale investment type apartment development in the insurance field, the Metropolitan Life Insurance Company has pioneered in the art of selecting products which provide long-range maintenance economy. Its adoption of FABRON for Parkchester, its first and largest development, is an outstanding example.

FABRON is the *obvious choice* for *all* investment buildings and institutions whose decor need not be changed for long periods of time. *Obvious* – because its tough canvas backing, modern plastic core and non-peeling lacquer surface overcome all the conditions which inevitably lead to costly periodic redecorations.

Washability is, of course, assured, as are sunfastness and protection against plaster cracks, together with simple inlay repair of any damage to the material itself. The label of the Underwriters' Laboratories, Inc., attests FABRON's resistance to fire spread. Furthermore, unlike other wall finishes, the initial investment in FABRON is never irretrievably lost, for FABRON provides an ideal base for any subsequent decorative treatment.

Our Architects' Consulting Department is at your disposal to extend to you any service that may simplify your task in specifying, estimating, color scheming, etc. and to carry out your ideas to a practical execution.

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Dubin & Dubin, Architects

1 A color for every design! *Cabot's Collopakes offer an amazingly wide selection of 32 attractive colors.*

2 Cabot's Collopakes retain their lively colors — look fresh and bright for years.

No fillers or adulterants are used.

3 Cabot's Collopakes have tremendous hiding power, produce a durable, procelain-smooth surface.

The pigments in Cabot's Collopakes are reduced — by the unique, patented Collopaking process — to particles many times as fine as in ordinary paints. These particles are colloidally dispersed in the vehicle.

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Write for new color card with complete information including suggested color combinations.

Samuel Cabot, Inc.
222 Oliver Bldg., Boston 9, Mass.

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 180*)

Embossed Metals

Idea Chart, Where and Why to Use Rigidized Metals. Convenient guide to product applications for a line of "texturized" metals. Fourteen standard patterns are illustrated, and 81 applications are listed together with reasons for using the texturized metals such as — decorative texture, mar concealment, rigidity, heat diffusion, weight saving, etc. 1 page, illus. Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N. Y.

Acoustical Materials

Sound Control. Describes various Johns-Manville products which have been used to solve the problems of sound control. Typical installations are shown, and construction details illustrating current application methods are included. Pertinent data in the brochure covers sizes, weights and sound absorption values of the different materials. 16 pp., illus. Johns-Manville, 22 E. 40th St., New York 16, N. Y.*

Plastic Wall Covering, Upholstery

Kalistron Color Card. Twelve new (stock) colors for *Kalistron*, the plastic sheeting used as wall covering and upholstery material, are included in a new brochure-color card now being distributed by the United States Plywood Corp. A total of 29 colors and textures are illustrated in the folder. The new colors are coral, sandalwood, dove gray, pearl gray, avocado green, blue green, light blue, wedgewood blue, sand, lime and chartreuse. United States Plywood Corp., Flexwood and Flexglass Division, Weldwood Bldg., 55 W. 44th St., New York, N. Y.*

Movable Walls

Transite Movable Asbestos Walls. Describes partitional wall made of asbestos and cement that can be erected, dismantled and re-erected without loss of materials and with minimum of labor. Photographs illustrate recent installations in commercial, industrial and institutional buildings. Construction details show how the walls are assembled and cross sections of the wall components. Specifications are included. 24 pp., illus. Johns-Manville, 22 E. 40th St., New York 16, N. Y.*

(*Continued on page 184*)

What boiler would you recommend for a $350,000 home?

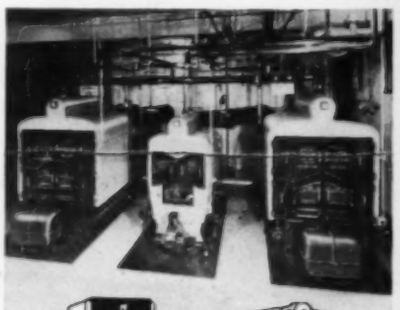
This functionally modern home was recently built in Bloomsburg, Pa., by Harry L. Magee president of The Magee Carpet Company; it is one of Pennsylvania's finest show places. Berninger, Haag, and D'Entremont, Architects; George A. Heath, Heating Engineer; Wm. L. Coombs, Heating Contractor; Percy Swank, Building Contractor.

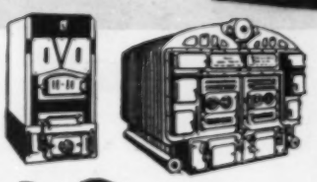
The finest, of course. That's what the architect, engineer, and contractor did when they built this magnificent home. In fact, they chose *six* H. B. Smith boilers — two to heat the main house, by radiant heat and by air conditioning . . . one to supply domestic hot water . . . two to warm the swimming pool water and recirculate it . . . still another to supply domestic hot water and car-washing water to the garage.

No matter the size of the home your client wishes, you can recommend an H. B. Smith boiler that will give him "luxury" heating at bargain basement prices—for Smith-Mills boilers are designed and engineered to deliver maximum heat at lowest cost. True, they cost a little more to buy, but smaller fuel and maintenance bills more than make up the difference.

Which boiler will you specify on the next job where the best in heating is requested? You can't go wrong if you recommend H. B. Smith! The H. B. Smith Co., 62 Main St., Westfield, Massachusetts.

Largest boiler room in the Magee residence (there are several others!) includes two No. 340 oil-fired boilers and one No. 24 Hy-Test oil-fired hot water supply unit, all H. B. Smith products.





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Fenestra* Standard Stock Metal Doors are in local stocks now—with your choice of finely-made, prefitted hardware and 25 types of locks. These attractive insulated doors are factory-wrapped to protect the finish.

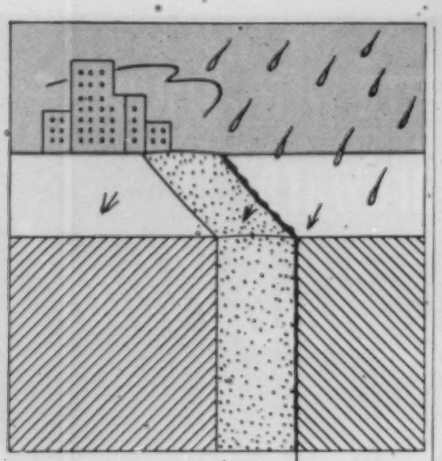
They come mortised, drilled, tapped and prime painted . . . complete with frames.

That's construction time and money saved.

Fenestra Doors are available with Underwriters' B Label. For further information on Fenestra Metal Doors, see Sweet's Architectural File 15a/7, or write to Detroit Steel Products Company, Dept. AR-2, 2252 E. Grand Boulevard, Detroit 11, Michigan.

*®

Fenestra **STANDARD STOCK METAL SWING AND SLIDE DOORS**



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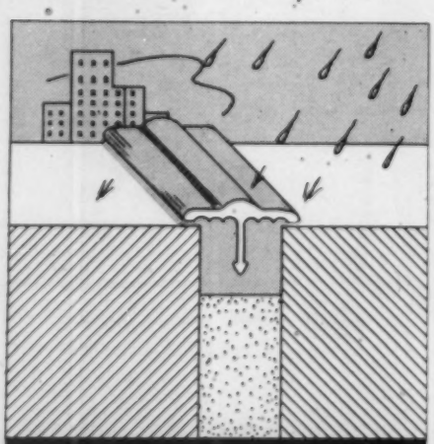

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NS-2-49 AR-2-49

(*Continued from page 182*)

Metal Store Fronts

Natcor Extruded Metal Store Fronts. Contains detailed drawings on glass settings; bar reinforcements; division, corner and reverse bars; cap hanger and facia mouldings; vertical and horizontal mouldings; awning hoods; awning and transom bars; and glass settings. Several typical installations are shown. 15 pp., illus. Natcor, Providence 9, R. I.*

Metal Doors

Fenestra Metal Doors — Swing and Slide. This catalog describes the new Fenestra stock hollow-metal entrance door and also other stock hollow metal swing and slide doors, frames, locks and hardware. Detailed drawings, specifications and installation instructions are included. 16 pp., illus. Detroit Steel Products Co., 3113 Griffin St., Detroit 11, Mich.*

Soda Fountains, Food Servers

Seco-Superex Custom-Bilt Soda Fountains (Catalog SS-1). Presents complete line of soda fountain equipment including counters, back bars, food serving equipment and accessories.

From a variety of individual units available, the equipment may be selected so as to form the soda fountain which will best meet the owner's requirements. Available for combination are: 1 ice cream unit, 1 dispenser unit, 3 disher vat units, 6 sink units, 4 sandwich units, 3 hot food units, 2 toast units, 2 clean glass units, 1 plain top unit, 2 plate dispenser units, 8 end filler sections and 5 back bar units. Also illustrated are fountain accessories, refrigeration units and fountain stools. Four typical soda fountain layouts are included. 32 pp., illus. Seco Co., Inc., 5206 S. 38th St., St. Louis 16, Mo.

Waste Receptacles

Bennett Bilt Waste Receptacles. Steel waste containers from 10 to 49 in. in height are illustrated. They come in white and green enamel finish, and have stainless steel feet to eliminate rust marks. A table of specifications lists overall dimensions, weights and type of inner container furnished. 8 pp., illus. The Bennett Mfg. Co., Alden, N. Y.*

(*Continued on page 186*)

Modern Steam Heat For New Catholic High School

In planning the heating installation for Canisius High School, Consulting Engineer L. A. Cherry met two basic requirements set up by the Building Committee of Canisius High School.

First, even, comfortable temperatures in all sections of the school. Second, reduce heating costs to a minimum.

Canisius Catholic High School, Buffalo, N.Y. Built 1947 and equipped with Webster Moderator System of Steam Heating. Albert A. Runschek, Architect. L. A. Cherry, Consulting Engineer. C. Brenner & Sons Co., Heating Contractor.

The Webster Moderator System was chosen because of its ability to answer these heating requirements. With Webster "controlled-by-the-weather" heating there is no overheating. An Outdoor Thermostat responds instantly to every change in outdoor temperature. A Manual Variator permits shut-off for reduced night heating.

Webster Representatives will gladly work with you from the time your building is in the planning stage until the heating system is operating to complete satisfaction.

If you are planning a new building or bringing an existing building up-to-date, let us show you how the Webster Moderator System fits in with heating needs. Get in touch with your Webster Representative or write us today.

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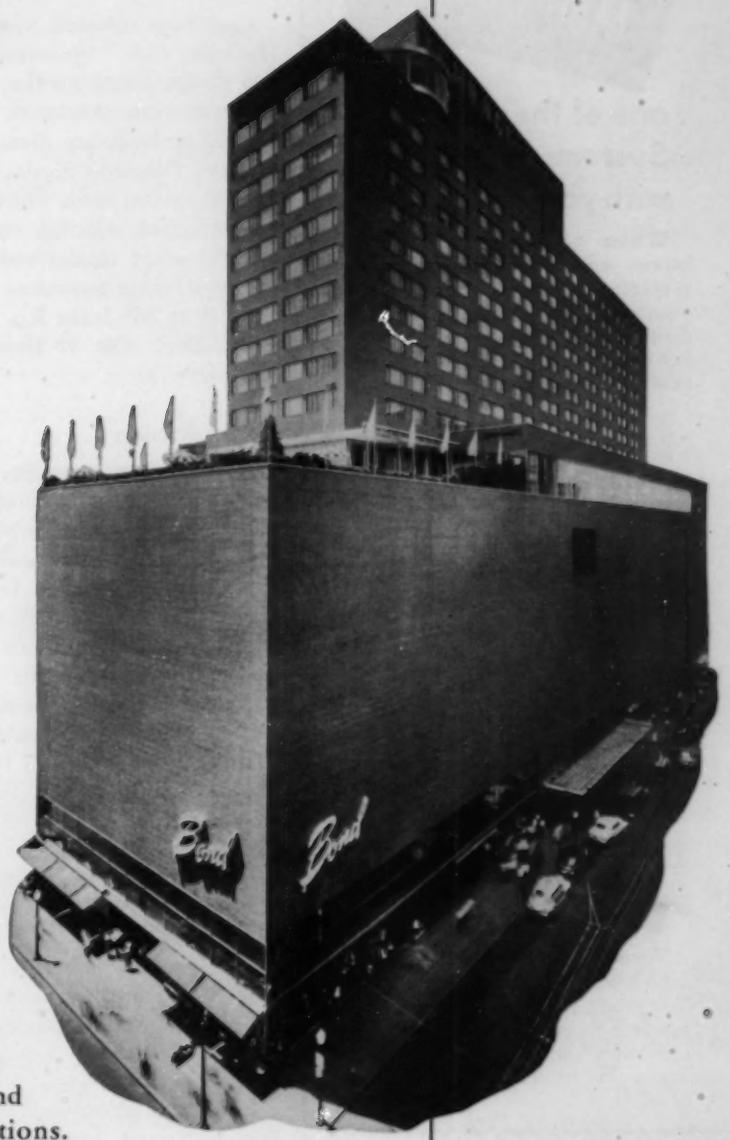
Camden, N.J.: Representatives In Principal Cities
In Canada, Darling Brothers, Limited, Montreal

WEBSTER MODERATOR SYSTEM OF STEAM HEATING
"Controlled by the weather"

Show readers how AAF Super-Clean Air benefits guests and owner alike at the new Terrace Plaza Hotel



YOU eat, sleep and relax in super-clean air at Cincinnati's new Terrace Plaza Hotel. Every one of the 324 guest rooms plus lobbies, restaurants and service quarters are served by a modern air conditioning system which includes AAF Electro-Cell Electronic Precipitators.

City dust and smoke can't encroach upon guests here. Super-clean air protects personal belongings as well as snowy white linens and sparkling glassware; helps maintain the "spic and span" appearance of furnishings and decorations. Management benefits, too, because absence of dust and smoke reduces cleaning and redecorating costs; prolongs the life of equipment. And, in the mercantile section on which this "penthouse hotel" rests, super-clean air assumes the added duty of protecting merchandise from soilage.

Super-clean air is not a luxury—it's a necessity to any business where dust and smoke can spoil a product, increase maintenance or turn away a customer. The right filter or electronic precipitator for your customers' needs will be found in American Air Filter's complete line of product. Over 25 years' successful engineering experience in this specialized field will enable you to deliver the maximum benefits of super-clean air. For complete information, call your local AAF representative or write direct to—

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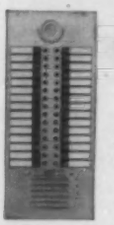
Telephones? Mail Boxes?

. . . one of these Couch Systems will dovetail with your specifications

When plans call for mail boxes and inter-suite 'phone systems, look to Couch for equipment to fill the bill. If you don't find the type you want illustrated below, a Couch representative will gladly assist you.

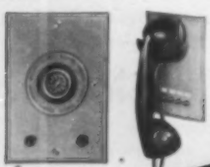


Vestibule Telephones

Type 74C — Cordless type illustrated is the most popular unit . . . no protruding attachments . . . easily installed.

Tilting Mailboxes

Type 73 — Post Office approved mail boxes for use with Vestibule Telephone. Features include frame separate from boxes for easy installation. Tenant doors can be set in open position for easy removal of mail.



Suite Telephones

Type 47 — Cordless suite phones make a neat installation and can be provided to give a variety of service. Type 52, handset instrument, provides greater convenience for particular installations.

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(*Continued from page 184*)

Packaged Steam Generators

Cyclotherm Automatic Steam Generators (*Bulletin P-1*). Operating principles and design characteristics of the Cyclotherm steam generators, which burn oil, gas or both, are discussed in this bulletin. Diagrams illustrate the combustion system used, which is said to provide quick, efficient steam generation. Standard ratings and dimensions are listed for the generators which range from 10 to 300 boiler h.p. Cyclotherm Corp., Dept. 33R, 90 Broad St., New York 4, N. Y.

Air Conditioning

Air Conditioning Design. The general procedure for designing an air conditioning system is described in this brochure published by the American Society of Refrigerating Engineers. Definitions of air conditioning terms are given. Other sections discuss heat loads to be considered, determining the amount of refrigeration needed, zoning, mechanical equipment and controls. 6 pp. The American Society of Refrigerating Engineers, 40 W. 40th St., New York 18, N. Y. *40 cents.*

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

Robert M. Bouma, Student, Apt. 203, 1301 N. Courthouse Road, Arlington, Va.

Bracken Engineering Company, 2216 Bedford Avenue, Johnstown, Pa.

Alvaro Cardenas, Architect, Carrera 13 No. 33–13, Bogota, Colombia, S. A.

William F. Cody, Architect, 11975 Santa Monica Boulevard, Los Angeles, Calif.

Guillermo Luis Fuchs, General Contractor, 9 de Julio 68, Cordoba, Argentina, S. A.

John S. McDonald, Architect & Engineer, 2438 Glenmore Avenue, Dayton 9, Ohio.

Henry Nathanson, Builder, 376 Clarke Avenue, Westmount, Que., Canada.

Harwood and Prince Co., Drafting Service, 1408 South Stearns Drive, Los Angeles 35, Calif.

Harry N. Roberts, Architect, Room 4, Washington Hardware Bldg., Kennewick, Wash.

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